

Pseudoscorpions from the mountains of northern Pakistan (Arachnida: Pseudoscorpiones)

Ложноскорпионы горных районов северного Пакистана (Arachnida: Pseudoscorpiones)

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КЛЮЧЕВЫЕ СЛОВА: Pseudoscorpiones, таксономия, фаунистика, экология, новый род, новые виды, Пакистан.

ABSTRACT. The false-scorpion fauna of the montane parts of northern Pakistan is updated. At present it contains 30 species, including six new: *Mundochthonius asiaticus* sp.n., *Tyrannochthonius oligochetus* sp.n., *Rheoditella swetlanae* sp.n., *Allochernes minor* sp.n., *Allochernes loebli* sp.n. and *Bipeltochernes pakistanicus* gen.n., sp.n. (Chernetidae). Detailed faunistic and taxonomic remarks as well as illustrations are provided to most of them. A new combination is proposed: *Bisetocreagris afghanica* (Beier, 1959), comb.n. ex *Microcreagris*. The identities of some species remain insecure, because their respective genera require revision. The fauna is mostly Palaeartic, but a few Oriental elements are apparent as well.

ZUSAMMENFASSUNG. Eine Übersicht über die Pseudoskorpion-Fauna der Berge Nordpakistans wird vorgelegt. Jetzt umfaßt die Fauna 30 Arten, einschließlich der sechs neuen: *Mundochthonius asiaticus* sp.n., *Tyrannochthonius oligochetus* sp.n., *Rheoditella swetlanae* sp.n., *Allochernes minor* sp.n., *Allochernes loebli* sp.n. und *Bipeltochernes pakistanicus* gen.n., sp.n. (Chernetidae). Ausführliche faunistische und taxonomische Beschreibungen sowie Abbildungen werden für die Mehrheit der Arten ergänzt. Eine neue Kombination wird vorgestellt: *Bisetocreagris afghanica* (Beier, 1959), comb.n. ex *Microcreagris*. Einige Determinationen sind unsicher, für deren Erklärung wäre Revision der betreffenden Gattungen nötig wäre. Die Fauna ist im Grunde paläarktisch, mit Ausnahme wenige orientalische Elemente.

РЕЗЮМЕ. Фауна ложноскорпионов горных районов северного Пакистана ныне представлена 30 видами, включая шесть новых: *Mundochthonius asiaticus* sp.n., *Tyrannochthonius oligochetus* sp.n., *Rheoditella swetlanae* sp.n., *Allochernes minor* sp.n., *Allochernes loebli* sp.n. и *Bipeltochernes pakistanicus*

gen.n., sp.n. (Chernetidae). Дана новая комбинация: *Bisetocreagris afghanica* (Beier, 1959), comb.n. ex *Microcreagris*. Для большинства видов приводятся детальные фаунистические и таксономические замечания, а также иллюстрации. Ряд определений вызывают сомнения, и для их уточнения необходимы родовые ревизии. Фауна в основном палеарктическая, но присутствуют и несколько ориентальных элементов.

Introduction

Pseudoscorpions from most parts of Central Asia are still poorly-known. This especially applies to the fauna of Pakistan. Thus, only five false-scorpion species have hitherto been reported from Pakistan: “*Chelifer*” *baltistanus* Caporiacco, 1935 from the Northern Areas [Caporiacco, 1935], currently referred to as a nomen dubium [Harvey, 1990]; *Atemnus politus* (E. Simon, 1878), a widespread South Palaeartic species recorded in the Northern Areas [Beier, 1959b]; *Dactylochelifer brachialis* Beier, 1952, a Central Asian species distributed from northern Iran in the West to north-western Mongolia in the East [Dashdamirov & Schawaller, 1995], also recorded in the Northern Areas [Beier, 1959b]; *Nannowithius pakistanicus* (Beier, 1978), only known from the North-West Frontier Province [Beier, 1978; Mahnert, 1988]; and *Rheodithella kalashana* Dashdamirov & Judson, 2004 from Chitral, Hindu Kush Mountains [Dashdamirov & Judson, 2004].

To fill in the gap, the present paper mainly focuses on pseudoscorpions from the mountains of northern Pakistan. The material serving as the basis for this study was chiefly obtained by Cl. Besuchet & I. Löbl as well as by S. Vit in 1983–1986, and by D. Agoati in 1988, now in the Museum d’histoire naturelle in Geneva (MHNG).

As one could expect, several new forms have been found. The opportunity is also taken here to redescribe and depict a number of previously described but poorly-known species. Most of the species recorded are illustrated, with their brief descriptions provided. The status of some species remains doubtful, because several generic revisions are necessary.

It is noteworthy that, when studying material of *Geogarypus* J.C. Chamberlin, 1930, an Olympus BH2-RFL + PM-10AD reflected light fluorescence microscope was used. This allowed to study the pigmentation of the palp and carapace in due detail.

Both measurements and terminology here accepted are those after Chamberlin [1931] and Harvey [1992].

In the text, each locality is followed by the respective number put in square brackets and referring to the numbers in Map. 1.

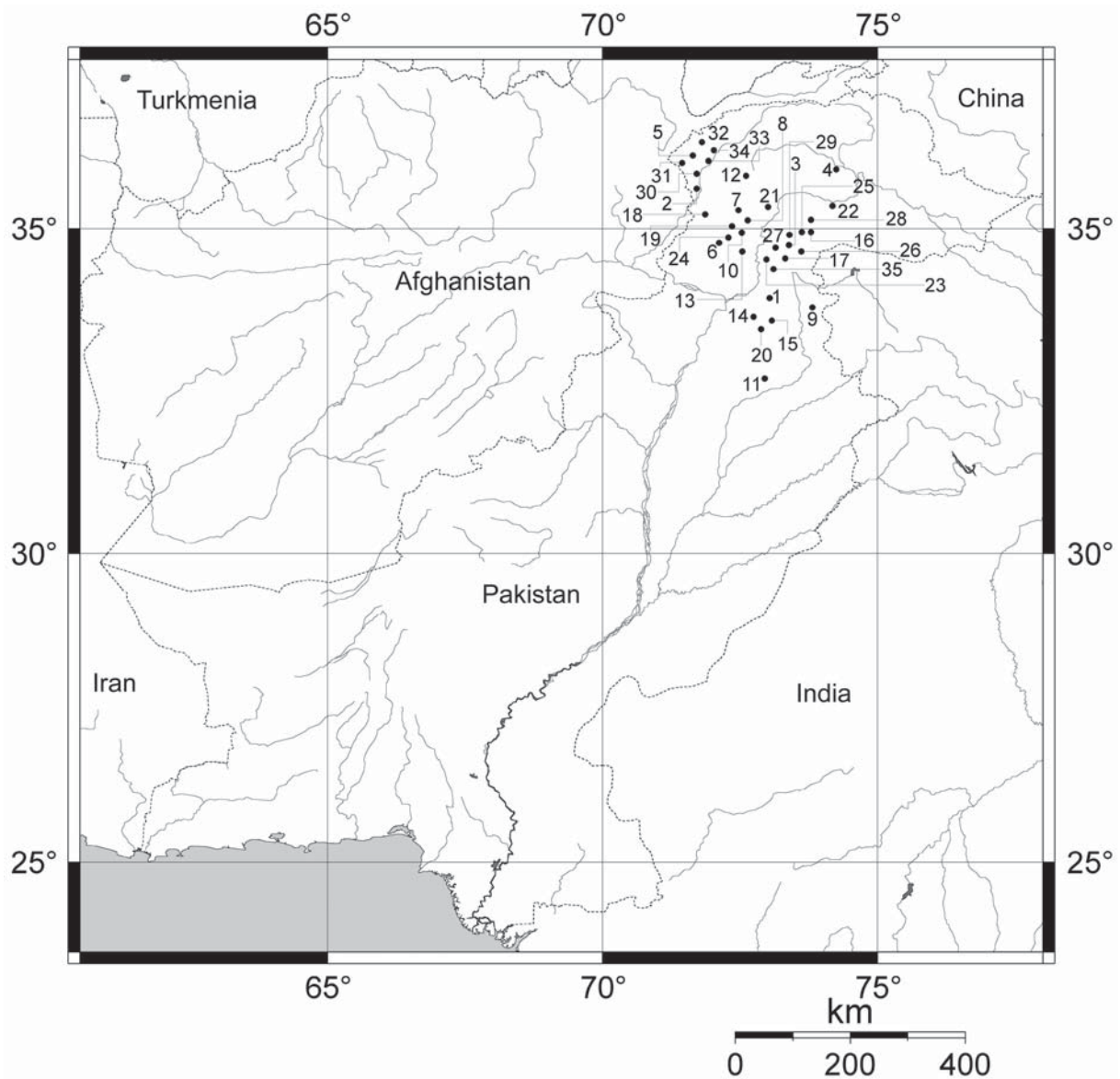
Systematics

Family CHTHONIIDAE Daday, 1888

Lagynochthonius himalayensis (Morikawa, 1968)
Figs 1–11.

MATERIAL. 1 ♂, 1 ♀ — 6a, Swat, above Miandam [7], 2300 m, under stones near snow and at river bank, 10.V.1983; 3 ♂♂, 1 ♀ — 13a, Swat, Ushu Valley, upstream of Kalam [21], 2300 m, under stones and in cowpats 15.V. 1983; 1 ♂ — 13b,

Map 1. Collecting localities of pseudoscorpions from the mountains of northern Pakistan.
Карта 1. Точки сборов ложноскорпионов из гор Северного Пакистана.

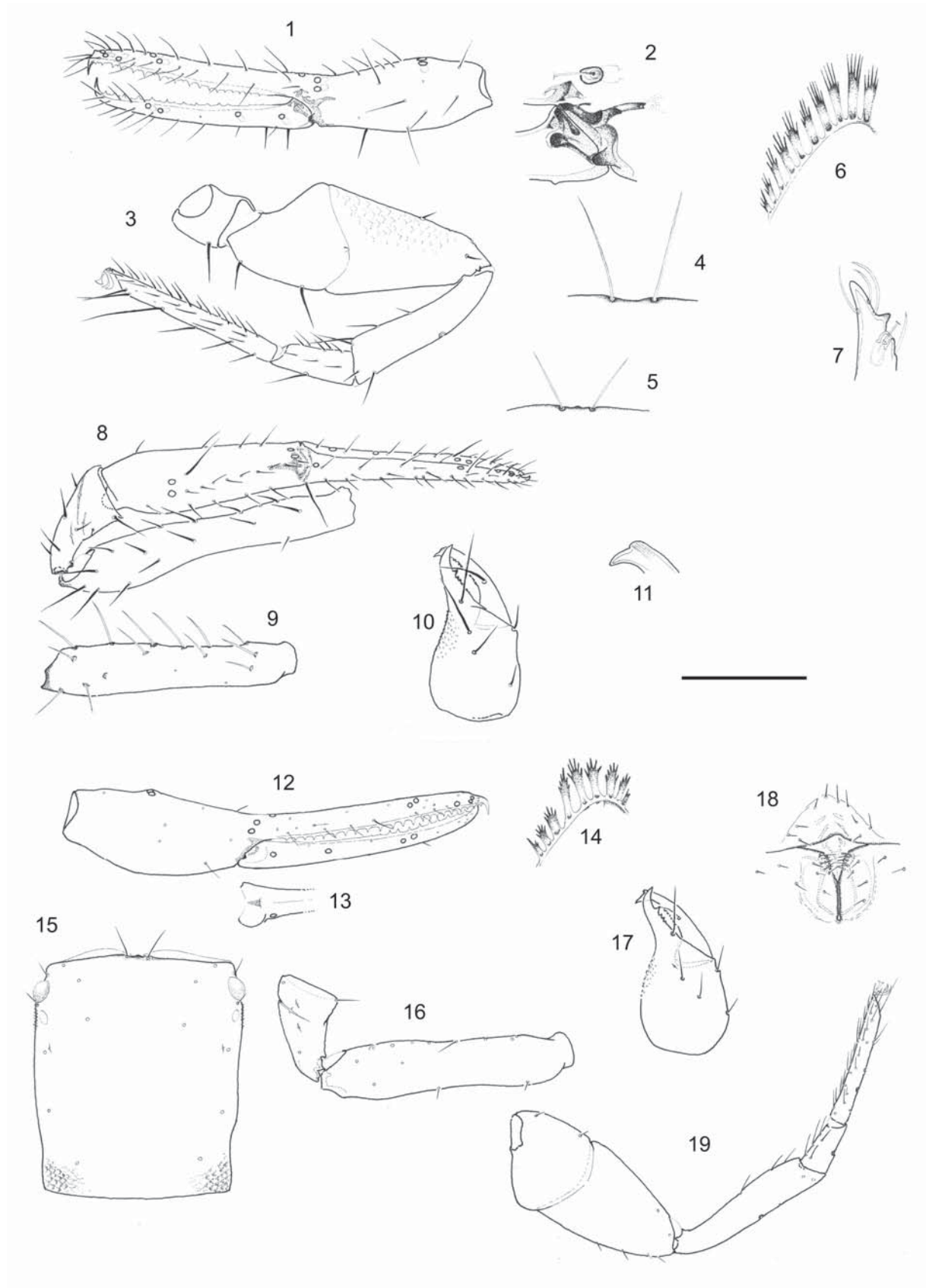


Swat, Ushu Valley, upstream of Kalam [21], 2300 m, in litter under bushes resembling hazel, in *Cedrus* forest, 15.V.1983; 1 ♀ — 14a, Swat, Madyan [10], 1400 m, near river bank, under stones at foot of trees and in cattle dung, 16.V.1983; 4 ♂♂, 9 ♀♀, 1 T — 9b, Swat, Kalam [8], 2100 m, sifted dead leaves in *Quercus* grove, 12.V.1983; 2 ♂♂, 1 ♀ — 4c, Swat, Malam Jabba [12], sifting in *Pinus* forest at foot of pine and walnut trees, 2300 m, 9.V.1983; 2 ♂♂, 1 ♀ — 6c, Swat, above Miandam [7], 2300 m, sifting near foot of *Abies* stump, 10.V.1983; 2 ♂♂, 1 ♀ — 15b, Swat, above Miandam [7], 2400–2500 m, sifted dead leaves and moss in *Abies* forest, 17.V.1983; 5 ♂♂ — 14b, Swat, Madyan [10], 1400 m, sifted dead leaves and moss, 16.V.1983; 1 ♀ — 13b, Swat, Ushu Valley, upstream of Kalam [21], 2300 m, sifted dead leaves under bushes resembling hazel, in *Cedrus* forest, 15.V.1983; 3 ♂♂ — 2b, Swat, Marghuzar [13], S of Saidu Sharif, sifted dead leaves at foot of trees, 1300 m, 8.V.1983; 3 ♂♂, 1 ♀ — 17b, Swat, Malam Jabba [12], 2500–2600 m, sifted dead leaves and moss in *Abies* forest, 18.V.1983; 1 ♀ — 12b, Swat, above Utrot [19], *Abies* and *Cedrus* forest, 2500–2600 m, under bark of *Abies* trunks, 14.VI.1983; 1 ♂ — 4a, Swat, Malam

Jabba [12], under stones, 2400 m, 9.V.1983; 2 ♂♂, 2 ♀♀ — 9b, Swat, Kalam [8], 2100 m, sifted dead leaves in *Quercus* grove, 12.V.1983; 2 ♂♂ — 2c, Swat, Marghuzar [13], S of Saidu Sharif, sifted dead broad leaves in *Quercus* grove, 1200 m, 8.V.1983; 4 ♂♂, 3 ♀♀ — 15b, Swat, above Miandam [7], 2400–2500 m, *Abies* forest, sifted dead leaves and moss, 17.V.1983; 1 ♂, 1 ♀ — 4b, Swat, Malam Jabba [12], sifted grass, moss, *Polyporus* and rotten wood, 2400 m, 9.V.1983; 1 ♀ — 6c, Swat, above Miandam [7], 2300 m, sifting near foot of *Abies* stump, 10.V.1983; 1 ♂ — 2a, Swat, Marghuzar [13], S of Saidu Sharif, under stones at stream edge, 1300 m, 8.V.1983; 3 ♂♂, 3 ♀♀ — 17b, Swat, Malam Jabba [12], 2500–2600 m, sifted dead leaves and moss in *Abies* forest, 18.V.1983, all leg. Cl. Besuchet & I. Löbl; 1 ♂ — Punjab, Margalla Hills [9], 11.V.1988, leg. D. Agoati; 2 ♂♂ — 5, Punjab, SE of Islamabad [15], in litter, 30.III.1986; 1 ♂ — 3, Punjab, Islamabad [14], soil on boulders and at roots, 28.VII.1986; 1 ♂ — 3, Punjab, S of Islamabad [20], soil on boulders and at roots, 28.VII.1986; 1 ♀, 1 P — 8, Punjab, near N-Rawal Lake [11], forest in lowland, fern litter and alluvium, 3. IV.1986; 1 ♂ — PAK-85/17, Hazara, Kaghan [3]

1 — Murree (*Calocheiridius centralis*, *Stenohya* sp., *Cheiridium minor*, *Cheiridium museorum*, *Allochernes minor* sp.n., *Bipeltocernes pakistanicus* sp.n., *Dendrochernes cyrneus*, *Megachernes pavlovskiyi*); 2 — Chitral, Bumburet (*Tyrannochthonius oligochetus* sp.n., *Bisetocreagris klapperichi*, *Atemnus politus*, *Atemnus* sp., *Pselaphochernes scorpioides*); 3 — Kaghan [Kāgān] Valley, NE-Mahandri [Mahāndri] (*Lagynochthonius himalayensis*, *Microbisium brevifemorum*); 4 — Gilgit (*Dactylochelifer brachialis*); 5 — Chitral (*Bisetocreagris klapperichi*); 6 — Hazara (Chthoniidae gen.sp.); 7 — Swat, Miandam (*Lagynochthonius himalayensis*, *Calocheiridius centralis*, *Bisetocreagris afghanica*, *Stenohya* sp., *Cheiridium museorum*, *Ceriochernes* (?) *vestitus*); 8 — Kalam (*Lagynochthonius himalayensis*, *Geogarypus* sp., *Bisetocreagris* sp., *Atemnus politus*); 9 — Margalla Hills (*Lagynochthonius himalayensis*); 10 — Swat, Madyan (*Lagynochthonius himalayensis*, *Geogarypus* aff. *continentalis*, *Olpium* (?) *lindbergi*, *Bisetocreagris* sp.); 11 — N-Rawal Lake (*Lagynochthonius himalayensis*, *Calocheiridius* sp.); 12 — Malam Jabba (*Lagynochthonius himalayensis*, *Rheoditella swetlanae* sp.n., *Bisetocreagris* sp., *Stenohya* sp., *Cheiridium museorum*, Chernetidae gen.sp., *Dendrochernes cyrneus*); 13 — Swat, Marghuzar (*Lagynochthonius himalayensis*, *Calocheiridius centralis*, *Megachernes pavlovskiyi*); 14 — Islamabad (*Lagynochthonius himalayensis*); 15 — SE-Islamabad (*Lagynochthonius himalayensis*); 16 — Ghuwool Valley (*Lagynochthonius himalayensis*, *Bisetocreagris* sp., *Stenohya* sp. B); 17 — Malkandi (*Lagynochthonius himalayensis*, Chthoniidae gen.sp., *Geogarypus* aff. *continentalis*, *Geogarypus* sp., *Olpium* (?) *lindbergi*, Olpiidae gen.sp., *Bisetocreagris afghanica*, *Bisetocreagris* sp., *Cheiridium minor*); 18 — Dir (*Lagynochthonius himalayensis*); 19 — Utrot (*Lagynochthonius himalayensis*, *Stenohya* sp.A, *Dactylochelifer lindbergi*, *Allochernes loebli* sp.n., *Ceriochernes* (?) *vestitus*, *Dendrochernes cyrneus*); 20 — S-Islamabad (*Lagynochthonius himalayensis*); 21 — Ushu (*Lagynochthonius himalayensis*, *Mundochthonius asiaticus* sp.n., *Bisetocreagris afghanica*, *Atemnus politus*); 22 — Shogran (*Geogarypus* aff. *continentalis*); 23 — Nathia Gali [Nathiagali] (*Olpium* (?) *lindbergi*); 24 — Karakar (Kandao) [Karākar] (*Olpium* (?) *lindbergi*); 25 — Naran (*Bisetocreagris klapperichi*, *Stenohya* sp.); 26 — Mahandri [Mahāndri] (“*Microcreagris*” sp., Chernetidae gen.sp.); 27 — Dunga Gali (*Stenohya* sp.C, *Ceriochernes* (?) *vestitus*); 28 — Above Naran (*Stenohya* sp., *Allochernes wideri*, Chernetidae gen.sp., *Dendrochernes cyrneus*); 29 — Between Naran and Kaghan [Kāgān] (*Cheiridium museorum*, *Allochernes wideri*, *Ceriochernes* (?) *vestitus*, *Dendrochernes cyrneus*, *Dinocheirus* aff. *transcaspicus*); 30 — Ustui Pass (*Bisetocreagris klapperichi*, *Atemnus politus*, *Atemnus* sp., *Ceriochernes* (?) *vestitus*); 31 — Lawarai Pass (*Atemnus politus*, *Atemnus* sp., *Ceriochernes* (?) *vestitus*); 32 — Lotkoh (*Atemnus politus*, *Dactylochelifer brachialis*); 33 — Madaglasht (*Dactylochelifer monticola*, *Dactylochelifer* sp., *Allochernes loebli* sp.n.); 34 — N-Madaglasht (*Ceriochernes* (?) *vestitus*); 35 — Changla Gali (*Ceriochernes* (?) *vestitus*, Chernetidae gen.sp.).

1 — Муррея (*Calocheiridius centralis*, *Stenohya* sp., *Cheiridium minor*, *Cheiridium museorum*, *Allochernes minor* sp.n., *Bipeltocernes pakistanicus* sp.n., *Dendrochernes cyrneus*, *Megachernes pavlovskiyi*); 2 — Читрал, Бумбурет (*Tyrannochthonius oligochetus* sp.n., *Bisetocreagris klapperichi*, *Atemnus politus*, *Atemnus* sp., *Pselaphochernes scorpioides*); 3 — Долина Каган, СВ — Махандри (*Lagynochthonius himalayensis*, *Microbisium brevifemorum*); 4 — Гилгит (*Dactylochelifer brachialis*); 5 — Читрал (*Bisetocreagris klapperichi*); 6 — Хазара (Chthoniidae gen.sp.); 7 — Сват, Миандам (*Lagynochthonius himalayensis*, *Calocheiridius centralis*, *Bisetocreagris afghanica*, *Stenohya* sp., *Cheiridium museorum*, *Ceriochernes* (?) *vestitus*); 8 — Калам (*Lagynochthonius himalayensis*, *Geogarypus* sp., *Bisetocreagris* sp., *Atemnus politus*); 9 — Холмы Маргаллы (*Lagynochthonius himalayensis*); 10 — Сват, Мадьян (*Lagynochthonius himalayensis*, *Geogarypus* aff. *continentalis*, *Olpium* (?) *lindbergi*, *Bisetocreagris* sp.); 11 — Озеро Сев — Равал (*Lagynochthonius himalayensis*, *Calocheiridius* sp.); 12 — Малам Джабба (*Lagynochthonius himalayensis*, *Rheoditella swetlanae* sp.n., *Bisetocreagris* sp., *Stenohya* sp., *Cheiridium museorum*, Chernetidae gen.sp., *Dendrochernes cyrneus*); 13 — Сват, Маргузар (*Lagynochthonius himalayensis*, *Calocheiridius centralis*, *Megachernes pavlovskiyi*); 14 — Исламабад (*Lagynochthonius himalayensis*); 15 — ЮВ — Исламабад (*Lagynochthonius himalayensis*); 16 — Долина Гувул (*Lagynochthonius himalayensis*, *Bisetocreagris* sp., *Stenohya* sp.B); 17 — Малканди (*Lagynochthonius himalayensis*, Chthoniidae gen.sp., *Geogarypus* aff. *continentalis*, *Geogarypus* sp., *Olpium* (?) *lindbergi*, Olpiidae gen.sp., *Bisetocreagris afghanica*, *Bisetocreagris* sp., *Cheiridium minor*); 18 — Дир (*Lagynochthonius himalayensis*); 19 — Утрот (*Lagynochthonius himalayensis*, *Stenohya* sp.A, *Dactylochelifer lindbergi*, *Allochernes loebli* sp.n., *Ceriochernes* (?) *vestitus*, *Dendrochernes cyrneus*); 20 — Ю — Исламабад (*Lagynochthonius himalayensis*); 21 — Ушу (*Lagynochthonius himalayensis*, *Mundochthonius asiaticus* sp.n., *Bisetocreagris afghanica*, *Atemnus politus*); 22 — Шогран (*Geogarypus* aff. *continentalis*); 23 — Натия Гали [Nathiagali] (*Olpium* (?) *lindbergi*); 24 — Каракар (*Olpium* (?) *lindbergi*); 25 — Наран (*Bisetocreagris klapperichi*, *Stenohya* sp.); 26 — Махандри („*Microcreagris*“ sp., Chernetidae gen.sp.); 27 — Дунга Гали (*Stenohya* sp.C, *Ceriochernes* (?) *vestitus*); 28 — Выше Нарана (*Stenohya* sp., *Allochernes wideri*, Chernetidae gen.sp., *Dendrochernes cyrneus*); 29 — Между Нараном и Каганом (*Cheiridium museorum*, *Allochernes wideri*, *Ceriochernes* (?) *vestitus*, *Dendrochernes cyrneus*, *Dinocheirus* aff. *transcaspicus*); 30 — Перевал Устуи (*Bisetocreagris klapperichi*, *Atemnus politus*, *Atemnus* sp., *Ceriochernes* (?) *vestitus*); 31 — Перевал Лаварай (*Atemnus politus*, *Atemnus* sp., *Ceriochernes* (?) *vestitus*); 32 — Лоткох (*Atemnus politus*, *Dactylochelifer brachialis*); 33 — Мадагласшт (*Dactylochelifer monticola*, *Dactylochelifer* sp., *Allochernes loebli* sp.n.); 34 — С — Мадагласшт (*Ceriochernes* (?) *vestitus*); 35 — Чангла Гали (*Ceriochernes* (?) *vestitus*, Chernetidae gen.sp.).



(Kāgān) Valley, NE-Mahandri (Mahāndri), Kamalban forest, 2200 m, *Aesculus* stump, 3.VII.1985; 1 ♂ — PAK-85/15, Hazara, Kaghan [3] (Kāgān) Valley, NE-Mahandri [Mahāndri], Kamalban forest, 1800 m, fern litter, 3.VII.1985; 1 ♂ — PAK-85/17, Hazara, Kaghan (Kāgān) Valley, NE-Mahandri (Mahāndri) [3], Kamalban forest, 2200 m, *Aesculus* stump, 3.VII.1985; 2 ♂♂ — PAK-85/11, Hazara, Kaghan [3] (Kāgān) Valley, Malkandi forest, dead leaves, 1.VII.1985; 1 ♂ — PAK-85/14, Hazara, Kaghan [3] (Kāgān) Valley, Malkandi forest, rotten conifer stump, 2.VII.1985; 1 ♂ — PAK-85/18, Hazara, Kaghan [3] (Kāgān) Valley, NE-Mahandri (Mahāndri), Kamalban forest, 2500 m, *Viburnum* litter, 3.VII.1985; 1 ♂ — PAK-84/13, Hazara, Malkandi [17], 1350 m, litter at foot of rock, 20.IV.1984; 1 ♀ — PAK-85/6, Hazara, Kaghan (Kāgān) Valley, 1800 m, Ghuzool Valley [16], Makhair forest, *Jubus* stump covered with fern, 30.VI.1985; 2 ♂♂ — PAK-85/18, Hazara, Kaghan [3] (Kāgān) Valley, NE-Mahandri (Mahāndri), Kamalban forest, 2500 m, *Viburnum* litter, 3.VII.1985; 1 ♂, 1 T — PAK-85/15, Hazara, Kaghan [3] (Kāgān) Valley, NE-Mahandri (Mahāndri) Kamalban forest, 1800 m, fern litter, 3.VII.1985, all leg. S. Vit; 1 ♂ — 35, Hazara, Malkandi, 1500 m, between Kawai and Mahandri (Mahāndri), [17], sifted dead leaves in broad-leaved forest, 2.VI.1983; 1 ♂ — 35, Hazara, Kaghan [3] (Kāgān), 2150 m, under stones at edge of stream above village, 2.V.1983; 3 ♂♂ — 20a, Dir [18], 1500 m, under stones, 20.V.1983, all leg. Cl. Besuchet & I. Löbl.

DESCRIPTION. MALE, FEMALE (from Swat, Miandam — 6a). Carapace slightly (1.037 times) broader than long; chaetotaxy 4–2(16); four eyes present, anterior eyes strongly convex. Epistomal process (Fig. 5) either very small but distinct (Swat, Miandam — 6a) or completely missing (Fig. 4) (Hazara, Kaghan (Kāgān) — 35). Setae at anterior margin of carapace (Figs 4, 5) either very long or small; setae slightly lanceolate.

Surface of tergites smooth, tergal chaetotaxy (♂) 4:4:4:5:6:6:6:6:6:6:2:2; (♀) 4:4:4:6:5:6:6:6:6:6:2:2. Sternal chaetotaxy (♂) 8:(3m)28/12(3m):(3m)6(3m):9:9:8:8:7:8:2:0:2; (♀) 10:(3m)10(3m):(3m)9(3m):11:9:9:8:8:9:2:0:2. Coxal area of typical facies, coxa II with 10–11 spines (Fig. 6). Intercostal tubercle absent. Chelicera with five setae in basal part; movable finger with a seta proximally of midway of finger; serrula exterior with 18 lamellae; fixed finger with ten, movable fingers with eight teeth; galea small, tuberculiform.

Palp relatively short but slender (Fig. 1, 8, 9); proportions: femur 5.17 (♂) or 4.8 (♀) times as long as broad; patella 2.07 (♂) or 1.91 (♀) times as long as broad; chela of slender facies, 5.96 (♂) or 5.22 (♀) times as long as broad.

Chela with dentition and trichobothriotaxy as illustrated (Fig. 1); fixed finger with 19 large, well-spaced teeth plus eight small intercalary teeth between anterior teeth; movable

finger with 12 teeth, plus about six small intercalary teeth between anterior teeth. Apodemes of movable finger complex: posterior apodeme long and in line with axis of finger; anterior apodeme directed downwards. Fixed finger with an accessory tooth at tip (Fig. 7).

Measurements (length/breadth, in mm). Carapace (♂) 0.33/0.34. Palp: femur (♂) 0.43/0.084, (♀) 0.48/0.1; patella (♂) 0.186/0.09, (♀) 0.199/0.104; chela (♂) 0.67/0.112, (♀) 0.71/0.14; length of hand (♂) 0.29; movable finger (♂) 0.38.

REMARKS. The present material is in complete accordance with the existing descriptions [Morikawa, 1968; Beier, 1976]. However, series 2b from Marghuzar, Swat is distinguished by strong and long setae of the pedipalp femur. In addition, one ♂ from Margalla Hills, Punjab, coll. Agoati, though peculiar by a very small body, shows the pedipalp proportions lying well within the variation range of this character. The other traits also agree with the concept of this species.

Mundochthonius asiaticus sp.n.

Figs 20–31.

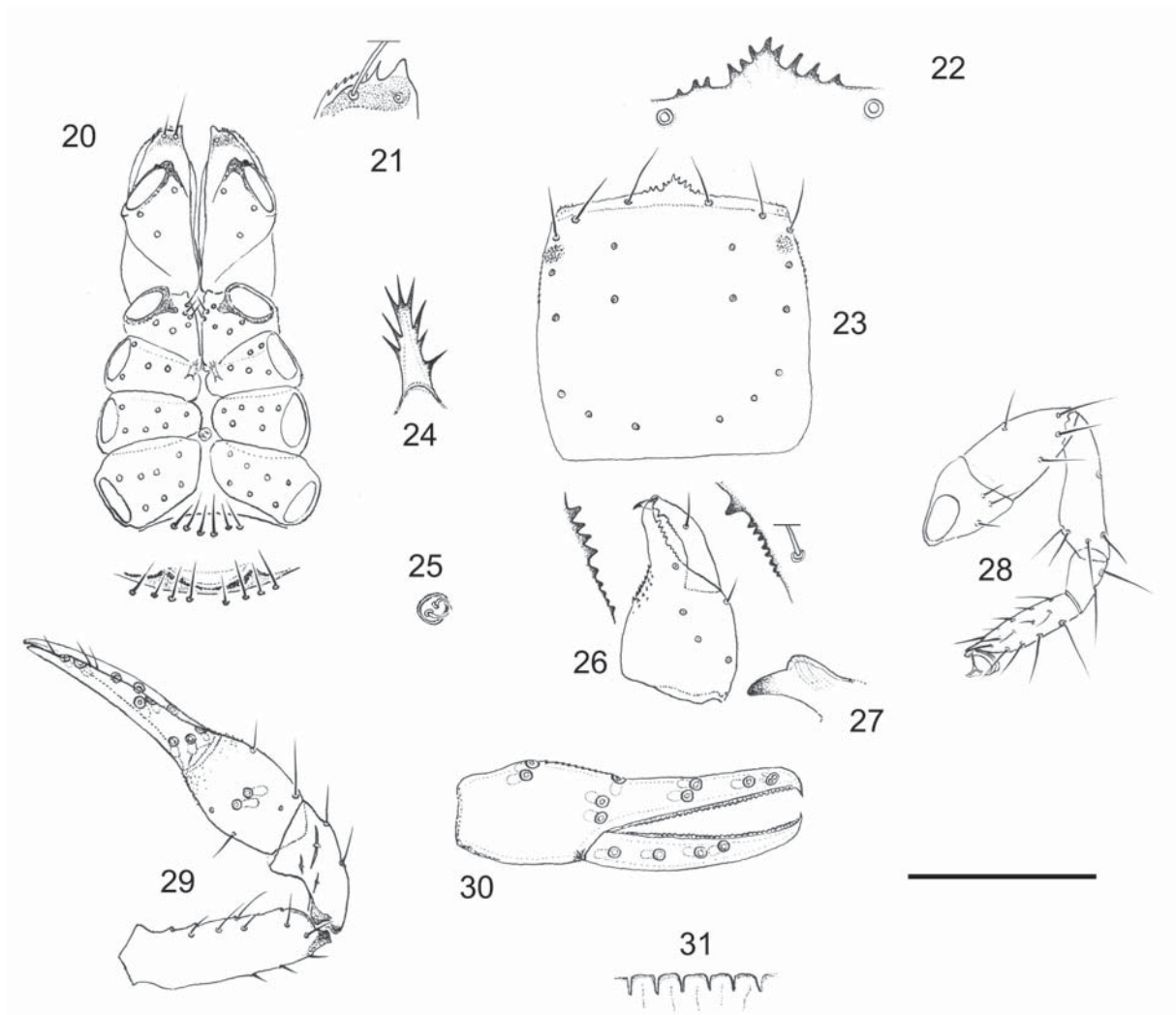
MATERIAL. Holotype ♀ — 13b, Swat, Ushu Valley [21], upstream of Kalam, 2300 m, litter under bushes resembling hazel, *Cedrus* forest, 15.V.1983, leg. Cl. Besuchet & I. Löbl.

DESCRIPTION. A very small species with only a single pair of strongly reduced eyes; dorsal sclerotic parts of carapace and abdomen slightly pigmented; pedipalps pale yellow, chelicerae and legs almost white. Carapace (Figs 22, 23) very slightly (1.03 times) longer than broad, with only two, feebly visible, small eyes; anterior margin denticulate in the middle, with a well-developed and dentate epistome, lateral margin with minute denticles. Carapace with 6–8–6 (20) setae; setae slightly lanceolate.

Abdomen oval, a little damaged, therefore setae on some tergites rather poorly visible; surface of tergites smooth; tergal chaetotaxy 4:6:9:11:10:10:8(?):8:8(?):6:?:?. Chaetotaxy of last two segments obscure, so the above arrangement is possibly erroneous. Sternal chaetotaxy 6:(3m)8(3m):(3m)8(3m):13:14:14:10?:10:7(3+4 long tactile setae):4(2+2 long tactile setae):?:2. Coxal area of typical facies, setae P 5 (two on manducatory process), I 6, II 4–5, III 6, IV 7; coxa II with 1 spine (Fig. 24). Intercostal tubercle bisetose. Genital area as in Fig. 20. Chelicera with five setae in basal part; inner face with minute denticles; movable finger with a seta distad of midway of finger; serrula exterior

Figs 1–19. *Lagynochthonius himalayensis* (Morikawa, 1968) (1–11: ♂ (1–4, 6–11), ♀ (5)) and *Tyrannochthonius oligochetus* sp.n., holotype (12–19): 1 — left chela, lateral view, from Miandam; 2 — apodeme of movable finger of chela, lateral view, from Miandam; 3 — leg IV, lateral view, from Miandam; 4 — epistomal area of carapace, dorsal view, from Kaghan (Kāgān); 5 — epistomal area of carapace, dorsal view, from Miandam; 6 — coxal spines, from Miandam; 7 — tip of fixed finger of chela, dorsal view, from Miandam; 8 — dorsal aspect of left palp, from Ushu; 9 — femur of left palp, dorsal view, from Marghuzar; 10 — right chelicera, dorsal view, from Ushu; 11 — tip of movable cheliceral finger, dorsal view, from Ushu; 12 — right chela, lateral view; 13 — movable finger of right chela, dorsal view; 14 — coxal spines; 15 — carapace, dorsal view, showing mesh-like structure of carapace surface (posterolateral corner); 16 — femur and patella of left palp, dorsal view; 17 — right chelicera, dorsal view; 18 — ventral aspect of genitalia; 19 — leg IV, lateral view. Scale: 0.2 (1, 3–5, 8–10, 12, 13, 15–19), 0.1 (2, 6, 14), 0.05 (7) and 0.075 mm (11).

Рис. 1–19. *Lagynochthonius himalayensis* (Morikawa, 1968) (1–11: ♂ (1–4, 6–11), ♀ (5)) и *Tyrannochthonius oligochetus* sp.n., holotype (12–19): 1 — левая хела, вид сбоку, из Миандама; 2 — отросток подвижного пальца хелы, вид сбоку, из Миандама; 3 — нога IV, вид сбоку, из Миандама; 4 — фрагмент переднего (эпистомного) края карапакса, вид сверху, из Кагана; 5 — фрагмент переднего (эпистомного) края карапакса, вид сверху, из Миандама; 6 — коксальные шипы, из Миандама; 7 — вершина неподвижного пальца хелы, вид сверху, из Миандама; 8 — левая пальпа, вид сверху, из Ушу; 9 — бедро левой пальпы, вид сверху, из Маргузара; 10 — правая хелицера, вид сверху, из Ушу; 11 — вершина подвижного пальца хелицеры, вид сверху, из Ушу; 12 — правая хела, вид сбоку; 13 — подвижный палец правой хелы, вид сверху; 14 — коксальные шипы; 15 — карапакс, вид сверху, показана ячеистая структура поверхности (заднебоковые углы); 16 — бедро и колено левой пальпы, вид сверху; 17 — правая хелицера, вид сверху; 18 — гениталии, вид снизу; 19 — нога IV, вид сбоку. Масштаб: 0,2 (1, 3–5, 8–10, 12, 13, 15–19), 0,1 (2, 6, 14), 0,05 (7) и 0,075 мм (11).



Figs 20–31. *Mundochthonius asiaticus* sp.n., holotype: 20 — ventral aspect of coxae and genital area; 21 — apex of right maxilla, showing chaetotaxy; 22 — epistomal area of carapace, dorsal view; 23 — carapace, dorsal view; 24 — coxal spine; 25 — intercoxal tubercle; 26 — right chelicera, dorsal view, showing dentitions of fingers; 27 — tip of movable cheliceral finger, dorsal view; 28 — leg IV, lateral view; 29 — right palp, dorsal view; 30 — right chela, lateral view; 31 — dentition of movable finger of chela. Scale: 0.2 mm (20, 23, 26, 28–30).

Рис. 20–31. *Mundochthonius asiaticus* sp.n., голотип: 20 — тазики и гениталии, вид снизу; 21 — вершина правой максиллы, показана хетатаксия; 22 — фрагмент переднего (эпистомного) края карапакса, вид сверху; 23 — карапакс, вид сверху; 24 — коксальные шипы; 25 — межкоксальный туберкул; 26 — правая хелицера, вид сверху, показаны зубчики пальцев; 27 — вершина подвижного пальца хелицеры, вид сверху; 28 — нога IV, вид сбоку; 29 — правая пальпа, вид сверху; 30 — правая хела, вид сбоку; 31 — зубчики подвижного пальца хелы. Масштаб: 0,2 мм (20, 23, 26, 28–30).

with 14 lamellae; serrula interior with ca 10–11 lamellae; flagellum with ca 10 blades; fixed and movable fingers with nine teeth, distal tooth being larger than the others; galea present as a tubercle.

Palp relatively robust (Fig. 29); proportions: femur 3.0 times as long as broad; patella 1.75 times as long as broad; chela 4.0 times as long as broad; hand with minute denticles dorsally, 1.33 times as long as broad; finger 2.0 times as long as hand.

Chela with dentition, trichobothriotaxy as illustrated (Fig. 30); fixed finger with 35, movable one with 36, teeth.

Legs IV typical (Fig. 28), tibia with a tactile seta near middle (TS=0.62), basitarsus also with a tactile seta (TS=0.51), telotarsus with a tactile seta proximad of middle

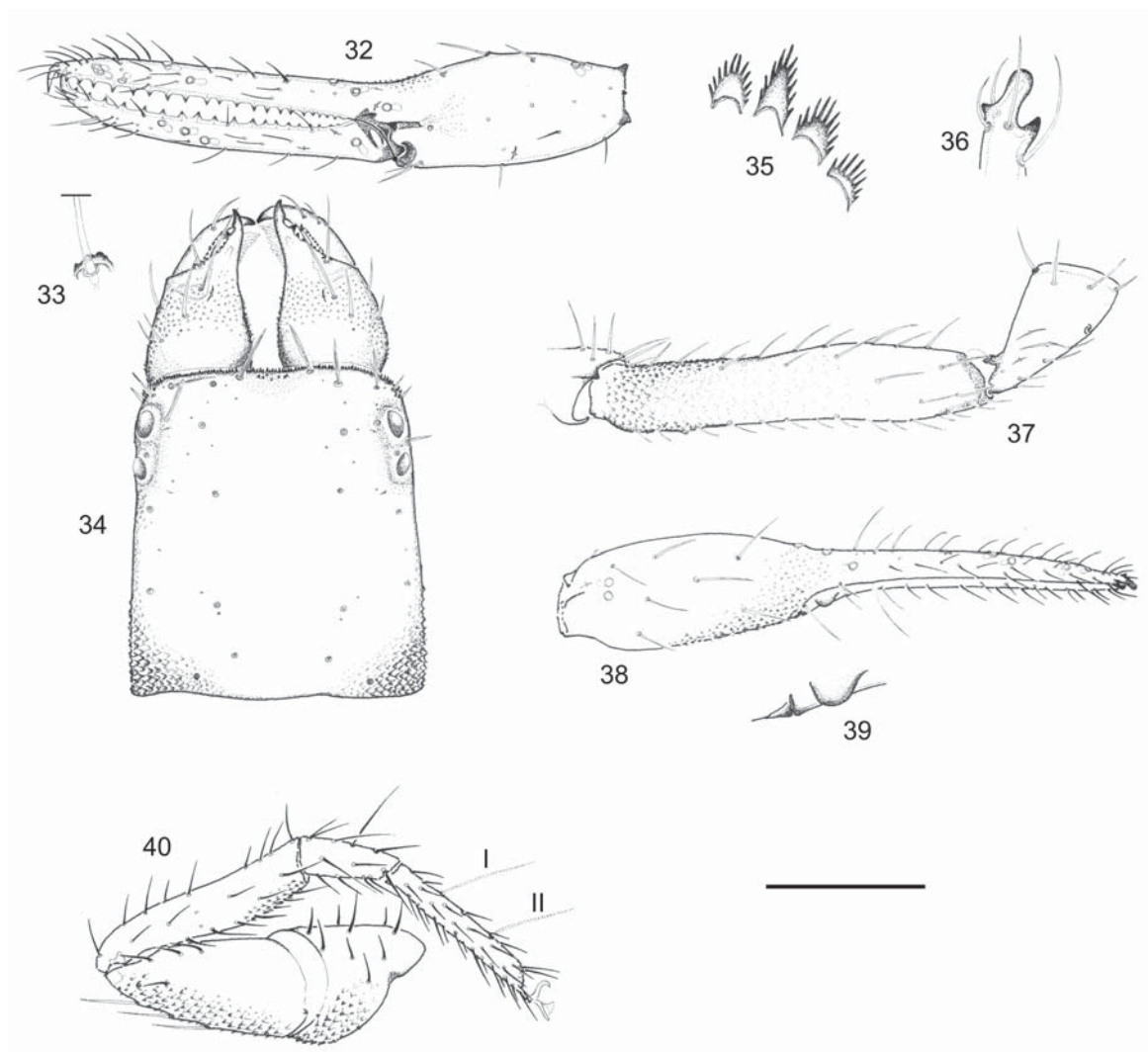
(TS=0.17), proportions: femur+patella 2.63 times as long as deep; tibia 3.4 times as long as deep; basitarsus 1.92 times as long as deep; telotarsus 3.61 as long as deep.

Measurements (length/breadth, in mm). Carapace 0.3/0.29. Palp: femur 0.18/0.06; patella 0.14/0.08; chela 0.36/0.09; length of hand 0.12; movable finger 0.24.

Leg IV (length/depth): femur+patella 0.21/0.08 (length of femur 0.10, length of patella 0.12); tibia 0.17/0.05; basitarsus 0.07/0.037; telotarsus 0.13/0.036.

DIAGNOSIS. This almost blind species differs from congeners by the small size as well as the size and proportions of the pedipalps.

REMARK. The new species represents the first record of the genus in Central Asia.



Figs 32–40. *Rbeoditella swetlanae* sp.n., holotype (MHNG): 32 — left chela, lateral view; 33 — areoles of seta IS of chelicera; 34 — carapace and cheliceres, dorsal view; 35 — coxal spines; 36 — tip of fixed finger of left chela; 37 — femur and patella of right palp, dorsal view; 38 — left chela, dorsal view; 39 — base of movable finger of left chela, dorsal view; 40 — leg IV, lateral view, showing two tactile setae (I and II). Scale: 0.2 (32, 34, 37, 38, 40), 0.1 (35) and 0.05 mm (36).

Рис. 32–40. *Rbeoditella swetlanae* sp.n., голотип (MHNG): 32 — левая хела, вид сбоку; 33 — ареол щетинки IS хелицеры; 34 — карапакс и хелицеры, вид сверху; 35 — коксальные щетинки; 36 — вершина неподвижного пальца левой хелы; 37 — бедро и колено правой пальпы, вид сверху; 38 — левая хела, вид сверху; 39 — основание подвижного пальца левой хелы, вид сверху; 40 — нога IV, вид сбоку, показаны две тактильные щетинки (I и II). Масштаб: 0,2 (32, 34, 37, 38, 40), 0,1 (35) и 0,05 мм (36).

Tyrannochthonius oligochetus sp.n.
Figs 12–19.

MATERIAL. Holotype ♂, — 24b, Chitral, Bumburet [2], sifted dead leaves and rotten wood, 2200 m; 24.V.1983, leg. Cl. Besuchet & I. Löbl.

DESCRIPTION. Colour of carapace and abdomen pale yellow, setae of carapace and abdomen very thin, short and sparse. Carapace (Fig. 15) slightly (1.13 times) longer than broad, with moderate net-like reticulation posterolaterally; anterior eyes large and well-developed, posterior eyes nearly one ocular diameter off anterior eye; epistome small and knob-like; chaetotaxy — 6:6:4:2 (18); setae very thin. Chaetotaxy of tergites: 4:4:4:6:6:6:6:6:5:4:?:2. Coxal setae P 5

(two small on manducatory process), I 3, II 3, III 5, IV 5; coxa II with 8–9 distally pinnate spines (Fig. 14). Intercoxal tubercle absent. Genital region as in Fig. 18; internal genitalia with 4 pairs of glandular setae; anterior operculum with 10 setae, posterior with (3m)12(3m), plus 7 along each side of notch [total (3m)19(3m)]; chaetotaxy of sternites IV–XII (3m)6(3m):10:9:9:8:8:7:2:?:2. Chelicera with five short setae in basal part; movable finger with a seta distad of midway of finger; fixed finger with four teeth (distal tooth being larger than the others), movable finger with six fine teeth. Serrulae and flagellum normal, chthonioid. Galea like a small tubercle.

Palp with trichobothriotaxy as illustrated (Figs 12, 13, 16). Proportions: femur 4.67 times as long as broad; patella

1.88 times as long as broad; chela 5.77 times as long as broad; hand 2.29 times as long as broad; finger 1.55 times as long as hand. Marginal teeth of chelal fingers sparse, acute, prominent, distinctly spaced; fixed finger of chela with 22, movable finger with 12 (9+3 small), teeth. Apodemes of movable finger small.

Legs IV typical (Fig. 19), proportions: femur+patella 2.44 times as long as deep; tibia 4.79 times as long as deep (TS=0.54); basitarsus 2.49 times as long as deep (TS=0.41); telotarsus 8.2 as long as deep (TS=0.73).

Measurements (length/breadth, in mm). Carapace 0.4/0.35. Palp: femur 0.43/0.092; patella 0.118/0.1; chela 0.69/0.12; hand length 0.28; length of movable finger 0.43. Leg IV (length/depth): femur+patella 0.38/0.16; tibia 0.297/0.062; basitarsus 0.122/0.05; telotarsus 0.25/0.03.

DIAGNOSIS. A clear-cut diagnosis of this new species is difficult to formulate, because *Tyrannochthonius* Chamberlin, 1929 is highly speciose. Yet *T. oligochetus* differs from congeners by the markedly sparser setae on the carapace, tergites and pedipalps as well as by the weakly developed posterior pair of eyes.

CHTHONIIDAE gen.sp.

MATERIAL. 1 T, 1 P — PAK-85/2, Hazara, Kaghan (Kāgān) Valley [6], 1450 m, Malkandi forest, at foot of rock, 29.VI.1985; 2 PP — PAK-85/24, Hazara, Kaghan (Kāgān) Valley [17], Malkandi forest, 450 m, old stump of broad-leaved tree and in rodent nest, 6.VII.1985; 1 P — PAK-84/11, Hazara, Kaghan (Kāgān) Valley [17], Malkandi, 1350 m, 19.IV.1984, all leg. S. Vit.

REMARK. The above material being represented by nymphs, a closer identification is impossible to make.

Family TRIDENCHTHONIIDAE Balzan, 1892

Rheoditella swetlanae sp.n.

Figs 32–40.

MATERIAL. Holotype ♀ — 17b, Swat, Malam Jabba [12], 2500–2600 m, sifted dead leaves and moss in *Abies* forest, 18.V.1983, leg. Cl. Besuchet & I. Löbl.

DIAGNOSIS. The new species differs from the only congener, the recently described *R. kalashana* Dashdamirov & Judson, 2004, by the smaller size, the chaetotaxy of the carapace, the proportions and structure of the pedipalps, as well as by the pattern of coxal spination.

DESCRIPTION. Carapace (Fig. 34) slightly (1.081 times) longer than broad, with moderate net-like reticulation laterally; eyes well-developed, posterior eye nearly one ocular diameter off anterior eye; anterior margin denticulate in the middle, without epistome; setae 10:m6m:4:6:2 (30); setae slightly lanceolate; microseta (m) lying below eyes (Fig. 34). Tergites with net-like reticulation, setae 4:6:6:6:6:6:?:6:4:6:2(?):0. Coxal setae P 13 (two on manducatory process), I 6, II 8, III 9, IV 17; coxa II with 4 spines, coxa III with 3–4 spines, spines relatively short, bipinnate for most of their length (Fig. 35); coxa I with a blunt apical process; coxa IV with posterior margin produced into a lobe and bearing more numerous (11) setae. Intercoxal tubercle absent. Chaetotaxy of sternites: 3+4+3:(3m)10(3m):(3m)6(3m):10:10:8:8:9:8:0(?):2(?):2. Pleural membrane of opisthosoma plicate.

Chelicera in basal part with minute denticles and with six setae; areoles supporting seta IS with a small crest before margin (Fig. 33); movable finger with one or two(!) setae distad of midway of finger; serrula exterior with 15 lamellae;

flagellum with eight(?) blades; fixed finger with seven teeth; movable finger with eight teeth, distal tooth being larger than the others; movable finger without elevated spinneret.

Palp with trichobothriotaxy as illustrated (Figs 32 & 38). Marginal teeth of chelal fingers sparse, acute, prominent, distinctly spaced; fixed finger of chela with 20 distinct plus two very small teeth basally; movable finger with 14 plus two very small teeth basally. Fixed finger with a large 'accessory tooth' (Fig. 36); when chela closed, then tip of movable finger resting between the terminal tooth of fixed finger and the accessory tooth. Base of moveable finger with a small knob (k) medially. Apodemes of movable finger typical: anterior apodeme directed downwards at an angle of about 45°; posterior apodeme long and in line with axis of finger. Femur basally and hand mediodistally with minute scale-like denticles. Proportions: femur 4.96 times as long as broad; patella 2.093 times as long as broad; chela 5.23 times as long as broad; hand 2.17 times as long as broad; finger 1.399 times as long as hand.

Legs IV typical (Fig. 40), basitarsus with a tactile seta near middle (TS=0.48), telotarsus with two tactile setae (TS1=0.28, TS2=0.6). Proportions: femur+patella 2.56 times as long as deep; tibia 4.24 times as long as deep; basitarsus 1.72 times as long as deep; telotarsus 7.15 as long as deep.

Measurements (length/breadth, in mm). Carapace 0.43/0.396. Palp: femur 0.54/0.108; patella 0.23/0.108; chela 0.77/0.15; hand 0.321; movable finger 0.45. Leg IV (length/depth): femur+patella 0.4/0.156; tibia 0.322/0.076; basitarsus 0.093/0.054; telotarsus 0.24/0.033.

ETHYMOLOGY. This species is gladly dedicated to my wife, Svetlana Belfeld, without whose help this study would have been impossible.

REMARKS. With the discovery of this second congener, the credibility of the recent erection of *Rheoditella* Dashdamirov & Judson, 2004, for a species from Chitral, northern Pakistan can no longer be questioned. Zoogeographically, this genus is indeed quite disjunct, as none of the other seven genera in the subfamily Verrucadithinae lives in Eurasia [Dashdamirov & Judson, 2004].

Family GEOGARYPIDAE J.C. Chamberlin, 1930

Geogarypus aff. *continentalis* (Redikorzev, 1934)

Figs 41–44.

MATERIAL. 1 ♂ — 37c, Hazara, Shogran [22], 2400 m, sifted dead leaves under bushes and pines, 3.VI. 1983; 1 ♀ — 14a, Swat, Madyan [10], 1400 m, near river bank, under stones at foot of tree and in cattle dung, 16.V.1983, all leg. Cl. Besuchet & I. Löbl; 1 ♂ — PAK-84/11, Hazara, Kaghan (Kāgān) Valley, Malkandi [17], 1350 m, 19.IV.1984; 1 ♂, 1 T, 2 DD — PAK-84/14, Hazara, Kaghan (Kāgān) Valley, Malkandi [17], 1350 m, dry barks and dead wood (*Acer?*), 20.IV.1984, all leg. S. Vit.

COMPARATIVE MATERIAL EXAMINED. *Geogarypus continentalis* (Redikorzev, 1934) (Figs 47 & 48): 1 ♂ — Kazakhstan, Almata Region, Dzhambul Distr., 43 km NW of Kopa, dry hills, 12.V.1992, leg. A. Zyuzin. See also Dashdamirov & Schawaller [1993a, b].

Geogarypus sp. A (Figs 49, 50): 1 ♂ — Russia, Volgograd Area, near Lake Elton, 16.VI.1999, leg. A. Gusarov.

Geogarypus sp. B (Figs 51–53): 1 ♂, 1 ♀, 1 T — Kirghizia, Tien-Shan Mts, Lake Issyk-Kul, litter, 1630 m, desert (?), 27.VI.1969, leg. P. Vtorov (MHNG), identified by Mahnert (1977) as *G. irrugatus* (E. Simon, 1899).

Geogarypus aff. *longidigitatus* (Rainbow, 1897) (Figs 45, 46): 1 ♂ — Vietnam, Prov. Khanhhoa, forest at Nhatrang, litter, 30.VII.1996, leg. T.K. Sergeeva.

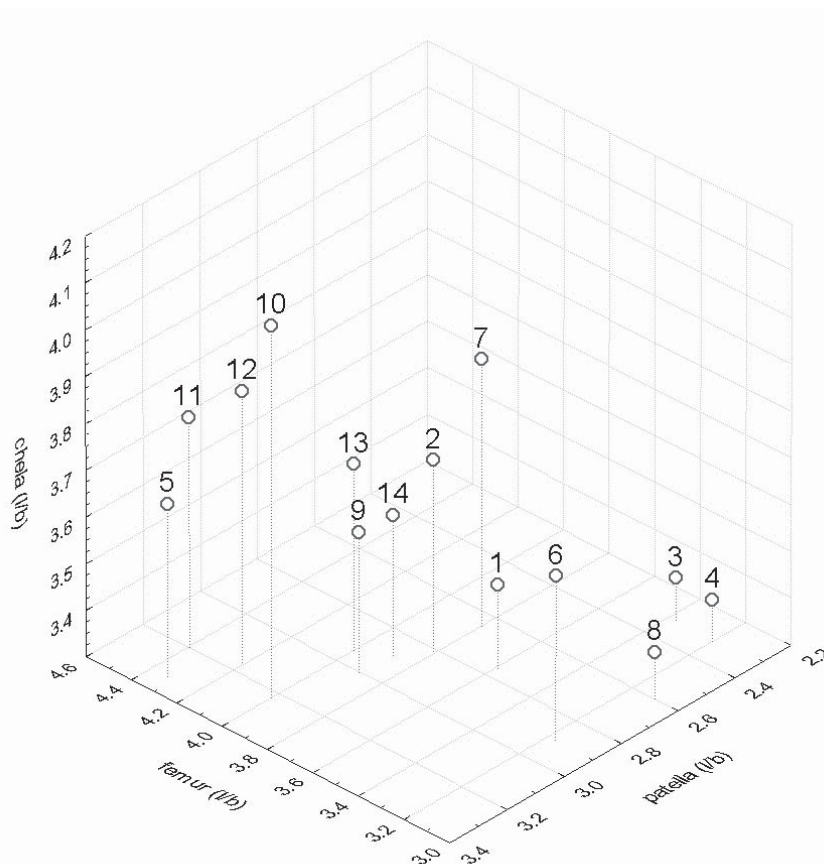


Fig. 41. 3D scatterplot of length/breadth ratios of pedipalp femur, patella and chela with pedicel in *Geogarypus* species: 1 — *G. aff. continentalis*, ♂ from Shogran, Pakistan; 2 — *G. aff. continentalis*, ♂ from Malkandi, Pakistan; 3 — *G. irrugatus*, ♂ syntype; 4 — *G. irrugatus*, ♀ syntype; 5 — *G. continentalis* (after Redikorzev [1934]); 6 — *G. continentalis*, ♂ from Dzhambul, Kazakhstan; 7 — *G. aff. longidigitatus*, ♂ from Nhatrang, Vietnam; 8 — *G. nepalensis*, ♀ (after Beier [1974]); 9 — *G. pulcher* Beier, 1963, ♀ (after Beier [1963]); 10 — *G. sp. A*, ♂ from Volgograd Area, Russia; 11 — *G. sp. B*, ♂ from Tien-Shan, Kirghizia; 12 — *G. sp. B*, ♀ from Tien-Shan, Kirghizia; 13 — *G. irrugatus*, ♂ from Bhutan (after Beier [1976]); 14 — *G. irrugatus*, ♀ from Bhutan (after Beier [1976]).

Notes. The measurements of both syntypes of *G. irrugatus*, courtesy of Mark Harvey. The records of this species in Bhutan [Beier, 1976] and in the Tien-Shan Mts [Mahnert, 1977] are considered here, though they might actually concern another congener.

Рис. 41. Трехмерный граф пропорций длины/ширины бедра, колена и хелы педипальпы у видов *Geogarypus*: 1 — *G. aff. continentalis*, ♂ из Шограна, Пакистан; 2 — *G. aff. continentalis*, ♂ из Малканди, Пакистан; 3 — *G. irrugatus*, ♂ синтип; 4 — *G. irrugatus*, ♀ синтип; 5 — *G. continentalis* (по Redikorzev [1934]); 6 — *G. continentalis*, ♂ из Джамбула, Казахстан; 7 — *G. aff. longidigitatus*, ♂ из Нячанга, Вьетнам; 8 — *G. nepalensis*, ♀ (по Beier [1974]); 9 — *G. pulcher*, ♀ (по Beier [1963]); 10 — *G. sp. A*, ♂ из Волгоградской области, Россия; 11 — *G. sp. B*, ♂ из Тянь-Шаня, Киргизия; 12 — *G. sp. B*, ♀ из Тянь-Шаня, Киргизия; 13 — *G. irrugatus*, ♂ из Бутана (по Beier [1976]); 14 — *G. irrugatus*, ♀ из Бутана (по Beier [1976]).

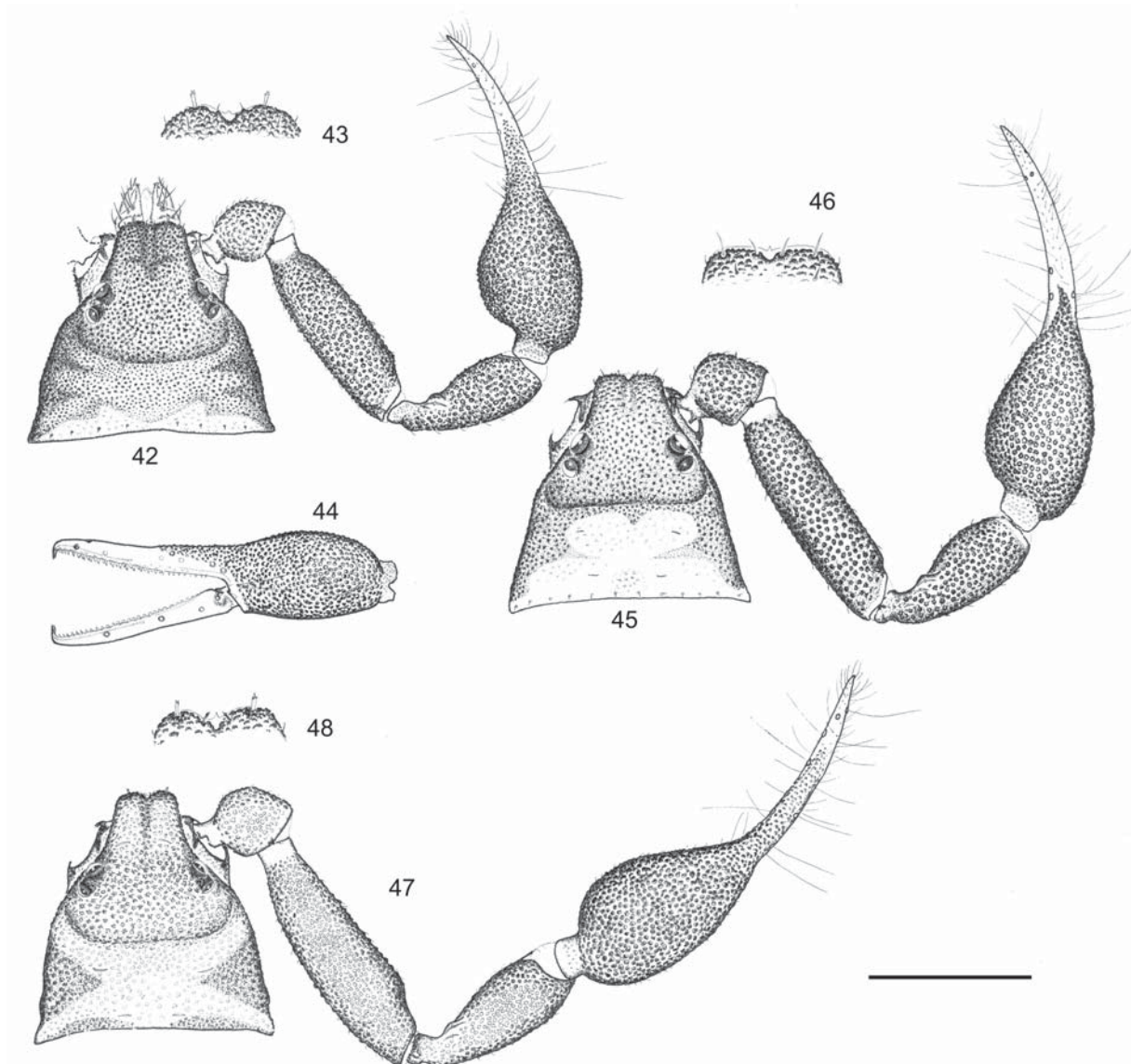
Замечания. Размеры обеих синтипов *G. irrugatus*, с любезной помощью Mark Harvey. Находки этого вида из Бутана [Beier, 1976] и Тянь-Шаня [Mahnert, 1977], указанные здесь, в действительности представляют другой вид данного рода.

REMARKS. The situation concerning the systematics of *Geogarypus* has recently been extensively discussed [Harvey, 2000]. Together with a long list of the synonyms of *G. longidigitatus* this author provided, he attempted to find the characters that would unequivocally allow species discrimination. As a result, not only several morphometric characters but also the coloration of the carapace and pedipalps were recognised as basic species-specific traits.

When studying *Geogarypus* material from the Caucasus as well as from Central and Southeast Asia, including the above samples from Pakistan, I have also come across difficulties in species identification. Yet the following observations can be presented.

Concerning carapace coloration, I can hardly consider it as an important character. Its great variation is obvious based on the abundant material of *G. continentalis* I have seen [Dashdamirov, 1993; Dashdamirov & Schawaller, 1993a, b]. The longer the material is kept fixed, the greater the degree of fading, hence the less the utility of this feature.

In contrast, the shape of variously shaped setae at the front margin of the carapace seems to represent a species-specific character. At least the setae differ in all of the forms/species of *Geogarypus* studied here (Figs 43, 46, 48, 50, 52). Thus, *G. continentalis* shows two large and terminally denticulate lateral as well as two smaller and also



Figs 42–48. *Geogarypus* aff. *continentalis* (Redikorzev, 1934) from Shogran, ♂ (42–44), *Geogarypus* aff. *longidigitatus* (Rainbow, 1897), ♂ (45, 46) and *Geogarypus continentalis* (Redikorzev, 1934), ♂ (47, 48): 42, 45, 47 — carapace and right palp, dorsal view; 43, 46, 48 — anterior margin of carapace, showing chaetotaxy; 44 — left chela, lateral view. Scale: 0.5 (42, 44, 45, 47) and 0.25 mm (43, 46, 48).

Рис. 42–48. *Geogarypus* aff. *continentalis* (Redikorzev, 1934) из Шограна, ♂ (42–44), *Geogarypus* aff. *longidigitatus* (Rainbow, 1897), ♂ (45 и 46) и *Geogarypus continentalis* (Redikorzev, 1934), ♂ (47 и 48): 42, 45 и 47 — карапакс и правая пальпа, вид сверху; 43, 46 и 48 — передний край карапакса, показаны характер и расположение щетинок; 44 — левая хела, вид сбоку. Масштаб: 0,5 (42, 44, 45, 47) и 0,25 мм (43, 46, 48).

terminally denticulate paramedian setae. In *G. aff. continentalis* from Pakistan, the condition is similar, but the lateral setae are denticuloclavate, whereas the paramedian setae are shorter and simple. In *G. aff. longidigitatus*, both lateral and paramedian setae are simple, the paramedian pair being only slightly shorter. A very similar situation is observed in *G. sp.A*, but the paramedian pair of setae is considerably shorter than the lateral pair. In *G. azerbaijzhanicus* Dashdamirov, 1993, all four setae are likewise simple but equal in length. The same situation, but in combination with a different proportion of the pedipalp segments, is observed in the sample referred to above as *G. sp.B*.

Another character seems to be the extent and degree of granulation on the dorsal face of the fixed palpal finger. Granulation if any can cover different parts of the finger, sometimes even surpassing its midway, more often being not very sharply delimited (Figs 42, 44, 45, 47, 49 & 51).

As the above material from Pakistan seems insufficient, it would be premature to describe it as a new species. However, to facilitate future work on this difficult genus, brief descriptions are provided below of all the forms quoted above in the material section.

DESCRIPTION. MALE from Shogran (37c; Figs 42–44). Colour pattern of carapace as in Fig. 42. Carapace slight-

ly (1.169 times) broader than long, posterior margin with 10 short setae. Proportions of pedipalp: femur 3.59 times as long as broad; patella 2.76 times as long as broad; chela with pedicel 3.48 times as long as broad; marginal teeth of chelal fingers sparse, acute, prominent and weakly spaced; fixed finger of chela with 27 teeth and 10 accessory teeth, movable finger with 30 teeth.

Measurements (length/breadth, in mm). Carapace 0.64/0.75. Palp: femur 0.61/0.17; patella 0.47/0.17; chela 1.01/0.29; length of movable finger 0.53.

MALE from Malkandi (84/11). Proportions of pedipalp: femur 3.81 times as long as broad; patella 2.81 times as long as broad; chela with pedicel 3.71 times as long as broad; hand 1.7 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 0.61/0.16; patella 0.45/0.16; chela 1.002/0.27; length of hand 0.46; length of movable finger 0.55.

MATERIAL of *G. irrugatus* (MNHN, PARIS). ♂: Carapace slightly (1.21 times) broader than long. Proportions of pedipalp: femur 3.37 times as long as broad; patella 2.31 times as long as broad; chela with pedicel 3.39 times as long as broad; hand 1.39 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 0.442/0.131; patella 0.314/0.136; chela (with pedicel) 0.672/0.198; hand 0.275; movable finger 0.371. Carapace 0.464/0.562.

♀: Carapace slightly (1.28 times) broader than long. Proportions of pedipalp: femur 3.198 times as long as broad; patella 2.32 times as long as broad; chela with pedicel 3.39 times as long as broad; hand 1.45 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 0.518/0.162; patella 0.371/0.160; chela (with pedicel) 0.837/0.247; hand 0.358; movable finger 0.448. Carapace 0.538/0.691.

MALE of *G. continentalis* (ZMUM; Figs 47, 48). Carapace slightly (1.03 times) broader than long. Proportions of pedipalp: femur 3.167 times as long as broad; patella 2.895 times as long as broad; chela with pedicel 3.65 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 0.76/0.24; patella 0.55/0.19; chela (with pedicel) 1.204/0.33; movable finger 0.68. Carapace 0.69/0.71.

MALE of *G. aff. longidigitatus* (ZMUM; Figs 45, 46). Carapace slightly (1.12 times) broader than long. Proportions of pedipalp: femur 3.8 times as long as broad; patella 2.65 times as long as broad; chela with pedicel 3.77 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 0.722/0.19; patella 0.514/0.194; chela (with pedicel) 1.162/0.31; movable finger 0.682. Carapace 0.64/0.72.

MALE of *G. sp.A* (ZMUM; Figs 49, 50). Carapace slightly (1.103 times) longer than broad; anterior margin with four simple setae: 2 short paramedian and 2 considerably longer lateral. Palpal femur and patella light brown, with weakly visible spots laterally; hand dark brown. Proportions of pedipalp: femur 4.0 times as long as broad; patella 3.23 times as long as broad; chela with pedicel 4.096 times as long as broad; hand with pedicel 1.75 times as long as broad. Fingers longer than hand with pedicel; fixed finger with 44 well-visible and three small, knob-like, marginal teeth, movable finger with 35 teeth, accessory teeth lacking.

Measurements (length/breadth, in mm). Palp: femur 0.76/0.19; patella 0.594/0.184; chela (with pedicel) 1.39/0.332; hand with pedicel 0.58; movable finger 0.762. Carapace 0.75/0.68.

MALE, FEMALE of *G. sp.B* (MHNG; Figs 51–53). Carapace slightly (1.065 (♂) or 1.013 times (♀)) broader than

long; eyes well-developed, posterior eyes positioned more horizontally. Colour pattern of carapace as in Fig. 51. As the material is old enough, the colour might have faded. Posterior margin of carapace with 10–12 setae. Colour of pedipalp: hand dark brown; femur and patella light brown with well-visible spots dorsolaterally. Femur without distomesal saddle-shaped constriction. Proportions of pedipalp: femur 4.396 (♂) or 4.214 (♀) times as long as broad; patella 3.2 (♂) or 3.16 (♀) times as long as broad; chela with pedicel 3.793 (♂) or 3.88 (♀) times as long as broad; hand with pedicel 1.89 (♂) or 1.79 (♀) times as long as broad. Fixed finger with 42, movable finger with 32, teeth, accessory teeth lacking.

Measurements (length/breadth, in mm). Palp: femur 0.8/0.182 (♂), 0.83/0.196 (♀); patella 0.58/0.18 (♂), 0.63/0.2 (♀); chela (with pedicel) 1.244/0.33 (♂), 1.36/0.35 (♀); hand with pedicel 0.62 (♂), 0.63 (♀); movable finger 0.68 (♂), 0.77 (♀). Carapace 0.66/0.7 (♂), 0.77/0.78 (♀).

REMARKS. The results of all these measurements, coupled with some more data derived from the literature, are presented in the form of a three-dimensional scatterplot (Fig. 41). Although, given the paucity of available material, such characters as the shape and length of setae at the front margin of the carapace as well as the pattern of granulation of the fixed palpal finger cannot be unequivocally taken as stable enough to prove species-specific, one can notice that the proportions in the Pakistani samples of *G. aff. continentalis* (1 and 2) occupy an intermediate position between those of *G. aff. longidigitatus* (7) and *G. continentalis* (6). A similar position is taken by the Bhutan samples (13 and 14) that Beier [1976] seems to have erroneously attributed to *G. irrugatus*. So, based at least on the characteristic pigmentation of the palpal femur and patella, we rather face here an undescribed species. Regrettably, since Harvey [2000] omitted the sizes and proportions of the palpal patella, they could not be incorporated into the scatterplot. In addition, the proportions derived from Redikorzev's [1934] description of *G. continentalis* also require verification.

Despite these shortcomings, one sees four more or less distinct assemblages/species: *continentalis*, *irrugatus*, *longidigitatus* and one more, probably new form.

Geogarypus sp.

MATERIAL. 1 D — 9b, Swat, Kalam [8], 2100 m, sifted dead leaves in *Quercus* grove, 12.V.1983, leg. Cl. Besuchet & I. Löbl; 1 P — PAK-84/14, Hazara, Kaghan (Kāgān) Valley, Malkandi [17], 1350 m, dry bark and dead wood (*Acer?*), 20.IV.1984, leg. S. Vit.

REMARK. This material being represented by immatures only, no closer identification could be made.

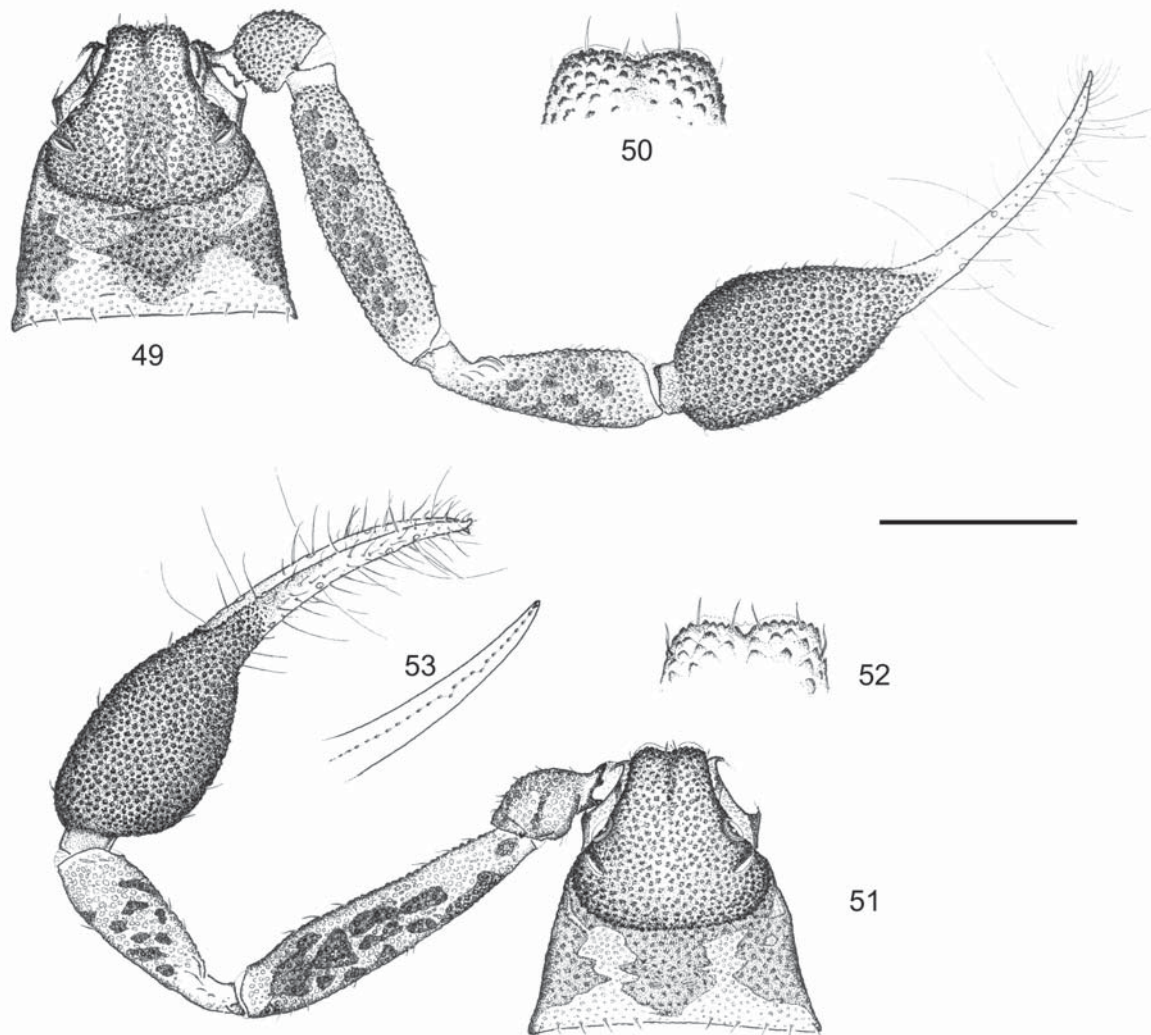
Family OLPIIDAE Banks, 1895

Calocheiridius centralis (Beier, 1952)

Figs 54–57.

MATERIAL. 5 ♂♂, 7 ♀♀, 3 TT — 2c, Swat, Marghuzar [13], S of Saidu Sharif, sifting in broad-leaved litter in *Quercus* grove, 1200 m, 8.V.1983; 1 ♂, 2 DD — 2b, Swat, Marghuzar [13], S of Saidu Sharif, sifted dead leaves at foot of trees, 1300 m, 8.V.1983; 1 ♀ — 6c, Swat, above Miandam [7], 2300 m, sifting near foot of *Abies* stump, 10.V.1983, all leg. Cl. Besuchet & I. Löbl; 2 ♂♂ — PAK-84/29, Punjab, Murree [1], 1950 m, hole in *Prunus* tree with *Lasius* sp. nest, 25.IV.1984, leg. S. Vit.

REMARKS. This species is very common throughout Central Asia, having been reported from Afghanistan, Iran,



Figs 49–53. *Geogarypus* sp. A, from Volgograd Distr., Russia, ♂ (49, 50), and *Geogarypus* sp. B, from Tien-Shan, Kirghizia (51–53): 49, 51 (♂) — carapace and right palp, dorsal view; 50, 52 (tritonymph) — anterior margin of carapace, showing chaetotaxy; 53 (♀) — fixed finger of left chela, ventral view. Scale: 0.5 (49, 51, 53) and 0.25 mm (50, 52).

Рис. 49–53. *Geogarypus* sp. A, из Волгоградской области, Россия, ♂ (49 и 50) и *Geogarypus* sp. B, из Тянь-Шаня (Киргизия) (51–53): 49 и 51 (♂) — карапакс и правая пальпа, вид сверху; 50 и 52 (тритонимфа) — передний край карапакса, показаны характер и расположение щетинок; 53 (♀) — неподвижный палец левой хелы, вид снизу. Масштаб: 0,5 (49, 51, 53) и 0,25 мм (50, 52).

Middle Asia and ?India. As discussed by Dashdamirov & Schawaller [1993], the characters of this genus remain rather indistinct. The material from northern Pakistan hardly clears up the situation. For example, the posterior margin of the carapace and the first tergite in some specimens show either 4 or 2 setae.

Another character of *C. centralis* seems to be the fixed finger of the chela bearing 8–12 stout lanceolate setae on the distolateral face.

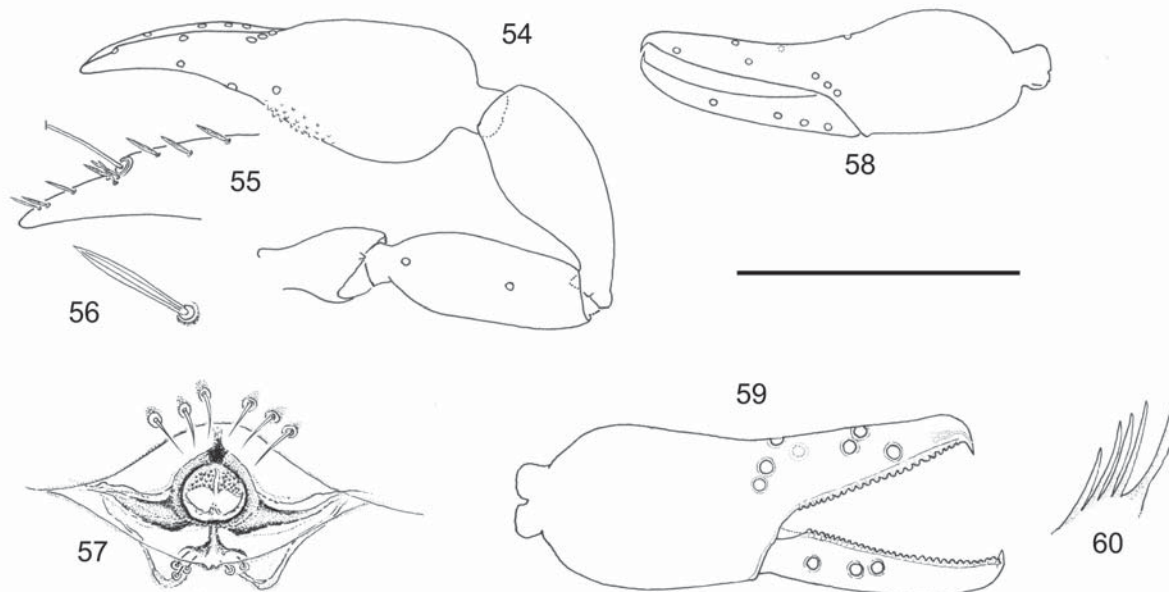
Calocheiridius sp.

MATERIAL. 1 T — 7, Punjab, N Rawal [11], lowland forest, bark, dead wood with *Polyporus* fungi, 3.IV.1986, leg. S. Vit.

Olpium (?) *lindbergi* Beier, 1959

Figs 58, 61–66.

MATERIAL. 2 ♂♂, 1 ♀ — 14a, Swat, Madyan [10], 1400 m, near river bank, under stones at foot of trees and in cattle dung, 16.V.1983; 1 ♂, 2 ♀♀ — 18b, Swat, valley and route S of Karakar (Karākar) [24], 1300 m, litter at foot of shrubs, 9.V.1983; 5 ♀♀, 1 D — 36, Hazara, Malkandi, 1500 m, between Kawai and Mahandri (Mahāndri) [17], sifted dead leaves and old branches in broad-leaved forest, 3.VI.1983, all leg. Cl. Besuchet & I. Löbl; 1 ♂ — PAK-85/10, Hazara, Kaghan (Kāgān) Valley [17], Malkandi forest, wood-clad slopes, 1.VII.1985; 1 ♀ — PAK-84/13, Hazara, Malkandi [17], 1350 m, litter at foot of rocks, 20.IV.1984; 1 ♀ — PAK-84/16, Hazara, Nathia Gali (Nathiagali) [23], 2300 m, hole in broad-leaved tree with *Polyporus*, 21.IV.1984, all leg. S. Vit.



Figs 54–60. *Calocheiridius centralis* (Beier, 1952), from Marghuzar, ♂ (54–57), *Olpium* (?) *lindbergi* Beier, 1959, from Kaghan (Kāgān) Valley, ♂ (58), and *Microbisium brevifemoratum* (Ellingsen, 1903), from Kaghan (Kāgān) Valley (59, 60): 54 — right palp, dorsal view; 55 — tip of fixed finger of right chela, showing small blade-like setae; 56 — vestitural seta of fixed finger of chela; 57 — genital area; 58 — left chela, lateral view; 59 — right chela, lateral view; 60 — flagellum. — Scale line: 0.5 (54, 58) and 0.3 mm (59).

Рис. 54–60. *Calocheiridius centralis* (Beier, 1952) из Маргузара, ♂ (54–57), *Olpium* (?) *lindbergi* Beier, 1959 из долины Каган, ♂ (58) и *Microbisium brevifemoratum* (Ellingsen, 1903) из долины Каган (59 и 60): 54 — правая пальпа, вид сверху; 55 — вершина неподвижного пальца правой хелы, показаны небольшие ланцетовидные щетинки; 56 — покровная щетинка неподвижного пальца хелы; 57 — гениталии; 58 — левая хела, вид сбоку; 59 — правая хела, вид сбоку; 60 — флагеллум. Масштаб: 0,5 (54, 58) и 0,3 мм (59).

REMARKS. Regrettably, the identities of the Asian species of *Olpium* L. Koch, 1873 are so badly confused that, prior to a complete revision of the relevant types, the determination of virtually any Central Asian congener is bound to require qualifications [Dashdamirov & Schawaller, 1993a]. Although most of the above specimens show four setae at the posterior margin of the first tergite (still one ♀ from Malkandi, 84/13, has them six!), as opposed to only two observed by Beier [1959], all the above Pakistani material has provisionally been attributed to *O. lindbergi*. A brief description of the most typical specimens from Madyan, Swat is given below.

DESCRIPTION. Carapace with four setae both at anterior and posterior margins (total number of very thin setae: 20); slightly longer than broad (♂ — 1.12, ♀ — 1.08 times). Abdomen oblong-oval, tergal chaetotaxy: 2:4:4:4:4:4:4:6(4+2 long tactile setae):6(4+2 long tactile setae):6(4+2 long tactile setae):2. Sternal chaetotaxy: x:4+4:2+4+2:4:6:4:4:4:6:6(4+2 long tactile setae):6(4+2 long tactile setae):2.

Palp relatively slender (Figs 58, 61–64, 66), distal portion of hand at base of fingers regularly and finely granulate interiorly; proportions: femur 3.38 (♂) or 3.29 (♀) times as long as broad; patella 2.63 (♂) or 2.56 (♀) times as long as broad; chela 3.54 (♂) or 3.14 (♀) times as long as broad; hand 1.71 (♂) or 1.55 (♀) times as long as broad; fixed finger 1.12 (♂) or 1.18 (♀) times as long as hand; fixed finger with 8–12 short, stout setae on distolateral side.

Measurements (length/breadth, in mm): Carapace 0.47/0.42 (♂), 0.52/0.48 (♀). Palp: femur 0.44/0.13 (♂), 0.5/0.152 (♀); patella 0.42/0.16 (♂), 0.46/0.18 (♀); chela 0.85/0.24 (♂), 0.91/0.29 (♀); length of hand 0.41 (♂), 0.45 (♀); movable finger 0.46 (♂), 0.53 (♀).

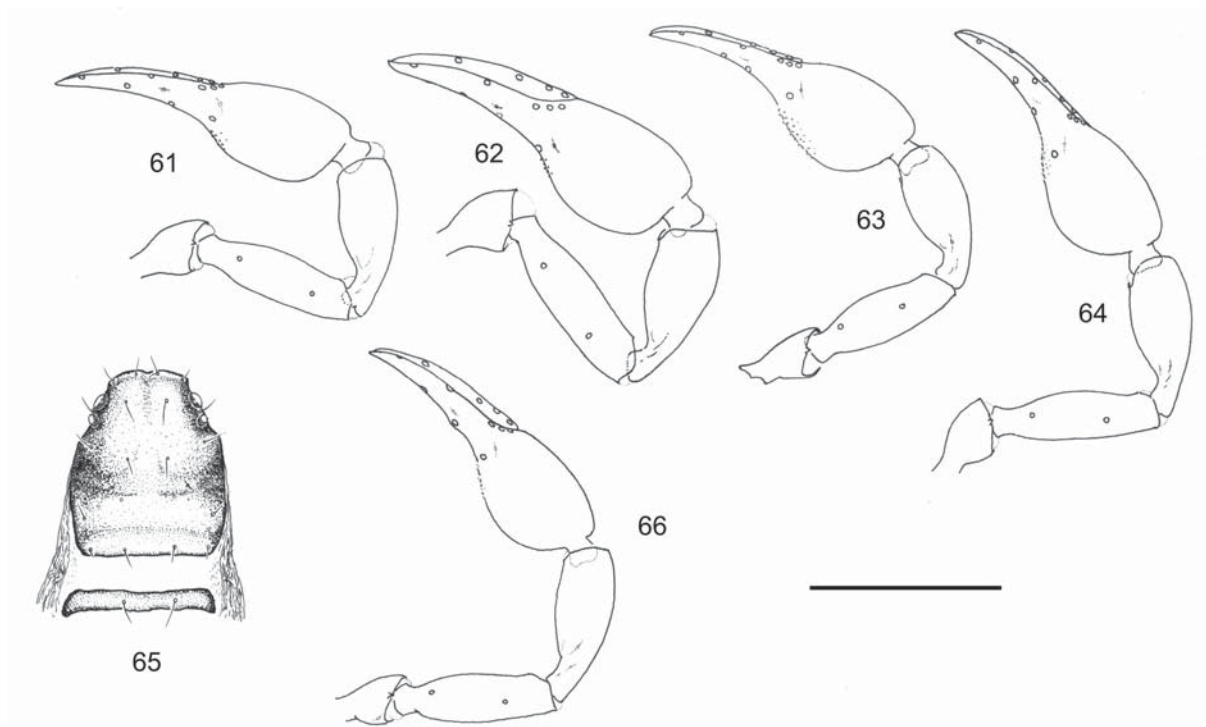
Olpiidae gen.sp.

MATERIAL. 1 D — 7, Punjab, N Rawal [11], lowland forest, bark and dead wood with *Polyporus* fungi, 3.IV.1986; 1 P, 1? (only chela and patella of pedipalp) — PAK-84/14, Hazara, Kaghan (Kāgān) Valley, Malkandi [17], 1350 m, dry bark and dead wood (*Acer?*), 20.IV.1984, all leg. S. Vit.

Family NEOBISIIDAE J.C. Chamberlin, 1930

Bisetocreagris afghanica (Beier, 1959), comb.n. Figs 67–74.

MATERIAL. 1 ♂, 1 ♀ — 15b, Swat, above Miandam [7], 2400–2500 m, *Abies* forest, sifted dead leaves and moss, 17.V.1983; 1 ♀ — 6c, Swat, above Miandam [7], 2300 m, sifting near foot of *Abies* stump, 10.V.1983; 2 ♂♂, 5 ♀♀, 1 T, 1 D — 13b, Swat, Ushu Valley [21], upstream of Kalam, 2300 m, litter under bushes resembling hazel, *Cedrus* forest, 15.V.1983, all leg. Cl. Besuchet & I. Löbl; 1 ♂, 1 T, 1 D, 1 P — PAK-84/14, Hazara, Kaghan (Kāgān) Valley, Malkandi [17], 1350 m, dry bark and dead wood (*Acer?*), 20.IV.1984; 1 ♂ — PAK-85/13,



Figs 61–66. *Olpium* (?) *lindbergi* Beier, 1959: 61 — right palp, dorsal view, ♂ from Madyan; 62 — right palp, dorsal view, ♀ from Madyan; 63 — right palp, dorsal view, ♀ from Malkandi; 64 — right palp, dorsal view, ♀ from Malkandi; 65 — carapace and first tergite, dorsal view, ♂ from Madyan; 66 — right palp, dorsal view, ♂ from Karakar (Karākar). Scale: 0.5 mm (61–66).

Рис. 61–66. *Olpium* (?) *lindbergi* Beier, 1959: 61 — правая пальпа, вид сверху, ♂ из Мадьяна; 62 — правая пальпа, вид сверху, ♀ из Мадьяна; 63 — правая пальпа, вид сверху, ♀ из Малканди; 64 — правая пальпа, вид сверху, ♀ из Малканди; 65 — карапакс и первый тергит, вид сверху, ♂ из Мадьяна; 66 — правая пальпа, вид сверху, ♂ из Каракара. Масштаб: 0,5 мм (61–66).

Hazara, Kaghan (Kāgān) Valley [17], Malkandi forest, rotten *Ficus* stump, 2.VII.1985, all leg. S. Vit.

DESCRIPTION (♂, Hazara, Kaghan Valley, Malkandi — PAK-85/13, and ♀, Swat, Ushu Valley — 13b). Carapace slightly longer than broad; four small eyes present. Epistomal process very small but distinct.

Surface of tergites and sternites smooth; sternites VI–VIII with median setae. Sternites II and III in ♂ as shown in Fig. 70.

Palp relatively short and stout (Figs 71–74); proportions: femur 3.27 (♂) or 3.06 (♀) times as long as broad; patella 2.28 (♂) or 2.2 (♀) times as long as broad; chela with pedicel 3.5 (♂) or 3.24 (♀) times as long as broad.

Chela with dentition and trichobothriotaxy as illustrated (Fig. 67); fixed finger with 39, movable finger with 42, teeth.

Measurements (length/breadth, in mm). Palp: femur (♂) 0.49/0.15, (♀) 0.38/0.124; patella (♂) 0.41/0.18, (♀) 0.33/0.15; chela with pedicel (♂) 0.84/0.24, (♀) 0.68/0.21; length of hand with pedicel (♂) 0.43, (♀) 0.324; length of movable finger (♂) 0.48, (♀) 0.36.

REMARKS. This new material proves to belong to a species previously referred to as *Microcreagris afghanica* Beier, 1959, described from Afghanistan [Beier, 1959]. However, based on two microsetae at the fore margin of ♂ sternite III as well as on palpal trichobothriotaxy, it is to be transferred to *Bisetocreagris* Curcic, 1983. Beier [1959] could simply have overlooked the very fine granulation on the hand of the chela, while the trichobothrial areoles on the

chela, which are actually very large, seem to have been depicted improperly, in a far too sketchy way.

Based on the relatively broad variation range of such characters as the proportions and sizes of the palp, this material reminds of *B. turkestanica* (Beier, 1929) [Dashdamirov & Schawaller, 1992].

Even though the original description of *B. afghanica* is adequate [Beier, 1959], the following notes, chiefly concerning palpal morphometry, are added as relevant.

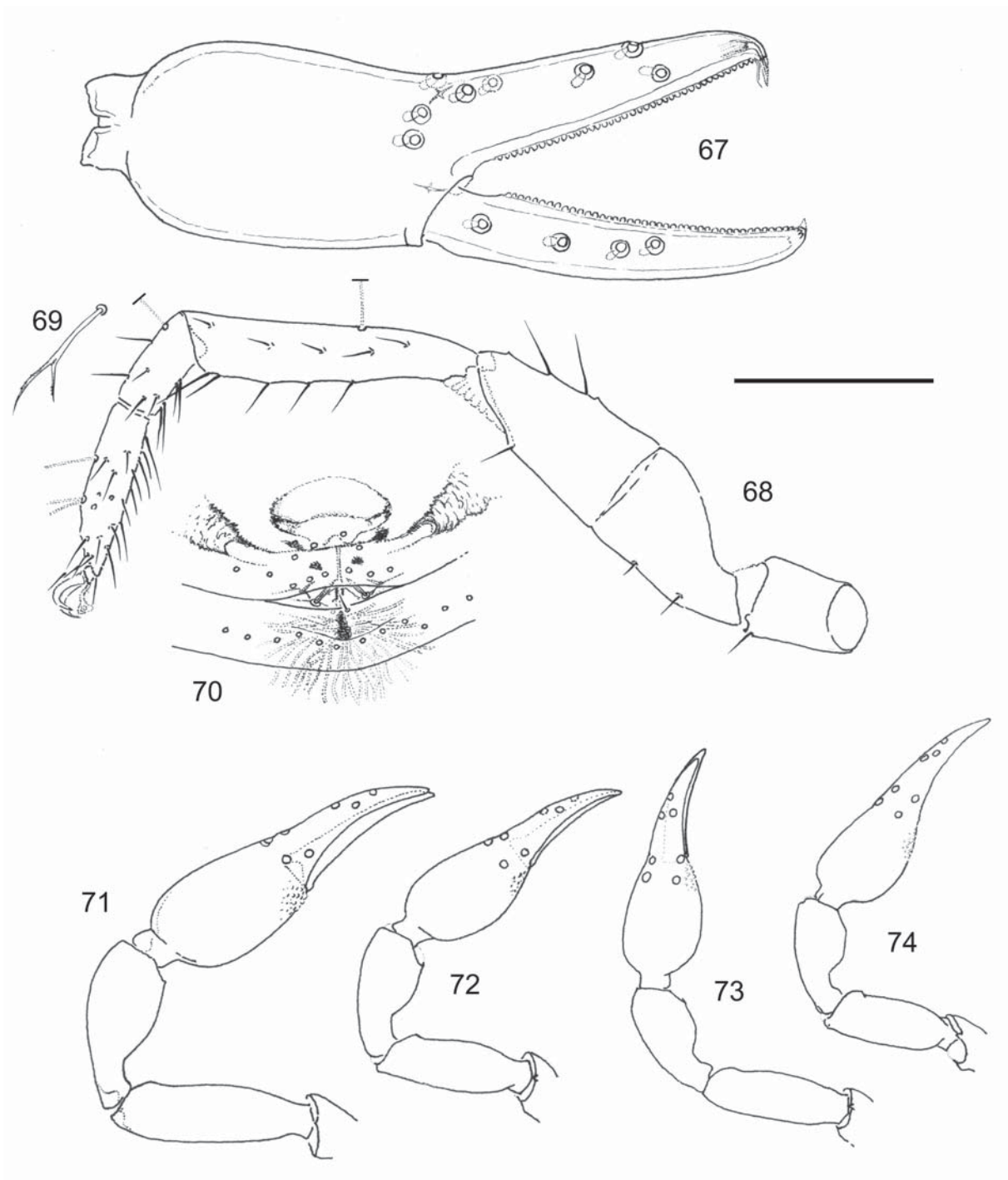
It also seems noteworthy that this species represents one of the poorly pigmented congeners. The main habitat appears to be litter.

Bisetocreagris klapperichi (Beier, 1959)

Figs 75–80.

MATERIAL. 3 ♂♂, 3 ♀♀, 2 TT, 1 D — 25c, Chitral, Bumburet [2], valley leading to Ustui Pass, sifted dead leaves under *Viburnum* shrubs, 2700 m, 25.V.1983; 1 ♂, 1 ♀, 2 TT — 25d, Chitral, above Bumburet, valley leading to Ustui Pass [5], sifting at foot of *Abies* tree, 2700 m, 25.V.1983, all leg. Cl. Besuchet & I. Löbl; 1 ♂, 3 ♀♀, 1 T, 1 ex. — PAK-85/20, Hazara, Kaghan (Kāgān) Valley, Naran [25], Lake Saiful Muluk, 3100 m, *Saxifraga* humus, 4–5.VII.1985, leg. S. Vit.

REMARKS. The above material differs from the original description only in a smaller size, whereas both the proportions of the palp and the pattern of granulation agree with those characteristic of *B. klapperichi*.



Figs 67–74. *Bisetocreagris afghanica* (Beier, 1959), comb.n.: 67–71 — ♂ from Malkandi: 67 — left chela, lateral view; 68 — leg IV, lateral view; 69 — subterminal seta of tarsus IV; 70 — genital area, ventral view; 71 — left palp, dorsal view; 72 — ♀ from Malkandi, left palp, dorsal view; 73 — ♂ from Ushu, left palp, dorsal view; 74 — ♂ from Miandam, left palp, dorsal view. Scale: 0.25 (67, 68, 70) and 0.5 mm (71–74).

Рис. 67–74. *Bisetocreagris afghanica* (Beier, 1959), comb.n.: 67–71 — ♂ из Малканди: 67 — левая хела, вид сбоку; 68 — нога IV, вид сбоку; 69 — субтерминальная щетинка лапки IV; 70 — гениталии, вид снизу; 71 — левая пальпа, вид сверху; 72 — ♀ из Малканди, левая пальпа, вид сверху; 73 — ♂ из Ушу, левая пальпа, вид сверху; 74 — ♂ из Миандама, левая пальпа, вид сверху. Масштаб: 0,25 (67, 68, 70) и 0,5 мм (71–74).

DESCRIPTION. MALE, FEMALE (Chitral, Bumburet — 25c). Carapace slightly longer than broad; four small eyes present. Epistomal process small but distinct.

Surface of tergites and sternites smooth; sternites VI–VIII with median setae. Sternites II and III in ♂ as shown in Fig. 76.

Palp relatively slender (Figs 77–80), femur with granulation on anterodorsal face, hand with moderate granulation mediolaterally; proportions: femur 3.63 (♂) or 3.44 (♀) times as long as broad; patella 2.23 (♂) or 2.36 (♀) times as long as broad; chela with pedicel 3.38 (♂) or 3.22 (♀) times as long as broad.

Measurements (length/breadth, in mm): Palp: femur (♂) 0.58/0.16, (♀) 0.62/0.18; patella (♂) 0.49/0.22, (♀) 0.52/0.22; chela with pedicel (♂) 0.98/0.29, (♀) 1.03/0.32; length of hand with pedicel (♂) 0.49, (♀) 0.53; length of movable finger (♂) 0.55, (♀) 0.55.

Bisetocreagris sp.

MATERIAL. 2 TT — 17b, Swat: Malam Jabba [12], 2500–2600 m, sifted dead leaves and moss in *Abies* forest, 18.V.1983; 1 T — 14b, Swat, Madyan [10], 1400 m, sifted dead leaves and moss, 16.V.1983; 1 T — Swat, Kalam [8], 2100 m, sifted dead leaves in *Quercus* grove, 12.V.1983; 1 T — 36, Hazara, Malkandi [17], 1500 m, between Kawai and Mahandri (Mahāndri), sifted dead leaves and old branches in broad-leaved forest, 3.VI.1983, all leg. Cl. Besuchet & I. Löbl; 1 T — PAK-85/6 Hazara, Kaghan (Kāgān) Valley, 1800 m, Ghuwool Valley [16], Makhair forest, stump of *Jubus* covered with fern, 30.VI.1983; 1 T — PAK-84/12, Hazara, Kaghan (Kāgān) Valley, Malkandi [17], 1350 m, at foot of *Fraxinus* tree, 19.IV.1984, all leg. S. Vit.

REMARKS. The above material representing immatures, no closer identification could be made.

Microbisium brevifemorum (Ellingsen, 1903)

Figs 59–60.

MATERIAL. 16 ♂♂ ♀♀, 6 DD, 6 PP — PAK-85/11, Hazara, Kaghan (Kāgān) Valley [3], Malkandi forest, dead leaves, 1.VII.1985, leg. S. Vit

REMARKS. The discovery of this boreo-alpine Palaearctic species in the mountains of northern Pakistan is quite surprising, representing the first record in the whole of Central Asia. These false-scorpions being extremely small, while the teguments poorly pigmented, the setae and trichobothria are very difficult to spot. However, there is no doubt that the above material represents *M. brevifemorum*.

Beier [1974] described a new genus and species of minute neobisiid, *Nepalobisium franzi* Beier, 1974, from a single female holotype from the Himalayas of Nepal. In all of its characters but the presence of 6, rather than 7, trichobothria on the fixed finger of the chela does this form agree with *Microbisium brevifemorum*. So either the holotype of *Nepalobisium franzi* presumably represents an artifact or Beier [1974] could simply have overlooked a trichobothrium. In addition, since some abnormal specimens of Neobisiidae show the number of trichobothria on the fixed chelal finger deviating from the norm [e.g. Curčić, 1980a], the proposal of such a new genus and species based on a single specimen can hardly be considered as justified.

To summarise, the status of *Nepalobisium* is highly doubtful, this “genus” most probably representing a junior synonym of *Microbisium* J.C. Chamberlin, 1930. However, only a restudy of the holotype of *Nepalobisium franzi* can allow to resolve the riddle.

“*Microcreagris*” sp.

MATERIAL. 1 T — PAK-85/16, Hazara, Kaghan (Kāgān) Valley, NE-Mahandri (Mahāndri) [26], Kamalban forest, litter, 2200 m, 3.VII.1985, leg. S. Vit.

Stenohya sp. A

Figs 81–91.

MATERIAL. 1 ♀ — 11b, Swat, above Utrot [19], *Abies* forest with *Cedrus*, under bark, 2600 m, 13.V.1983; 1 ♀, 6 DD, 2 PP — 12a, Swat, above Utrot [19], *Abies* forest with *Cedrus*, 2500–2600 m, 14.VI.1983; 1 ♀, 7 DD — 11 D, Swat, above Utrot [19], *Abies* forest with *Cedrus*, sifted moss, with a little of rotten wood, 2600 m, 13.V.1983; 8 PP — 11e, Swat, above Utrot [19], *Abies* forest with *Cedrus*, sifted rotten wood, dead leaves and moss, 2500 m, 13.V.1983; 2 DD, 2 PP — 11e, Swat, above Utrot [19], *Abies* forest with *Cedrus*, sifted rotten wood, dead leaves and moss, 2500 m, 13.V.1983; 1 P — 11c, Swat, above Utrot [19], *Abies* forest with *Cedrus*, sifted rotten wood, 2800 m, 13.V.1983; 1 D — 12c, Swat, above Utrot [19], *Abies* forest with *Cedrus*, 2500–2600 m, sifted rotten *Abies* wood, 14.VI.1983, all leg. Cl. Besuchet & I. Löbl.

OTHER MATERIAL EXAMINED. *Stenohya kashmirensis* (Schawaller, 1988), ♂ paratype — Kashmir, NW of Pahalgam, Aru, 2700 m, sifted litter in *Abies* forest, 13.X.1977, leg. H. Franz (SMNS 1464).

DESCRIPTION. FEMALE, PROTONYMPH (P), DEUTONYMPH (D), TRITONYMPH (T) (Swat, Utrot — 11b, 12a). Female very large (8 mm long). Carapace smooth, anterior margin depressed in the middle, slightly broader than long (♀, 1.01 times), with 24 setae, both anterior and posterior margins with six setae; four well-developed eyes present, posterior eye nearly one ocular diameter off anterior eye. Epistomal process small but distinct, tuberculiform.

Surface of tergites and sternites smooth. Pleural membranes granulostrate.

Tergal chaetotaxy — 8:10:11:14:16:15:12:11:11:10:8 (4+4 long tactile setae). Sternal chaetotaxy — ?:4m + 33 + 4m:6m+21+6m:24:18:22:20:18:12:8:?: sternites VI–VIII with median setae.

Chelicera with six setae on hand, movable finger with one seta; galea bifurcated, each branch with three subbranches (Fig. 87); flagellum (♀) with eight anteriorly pinnate blades; serrula exterior with 35, serrula interior with ca 24, lamellae. Fixed finger of chelicera with 19, movable finger with seven, teeth.

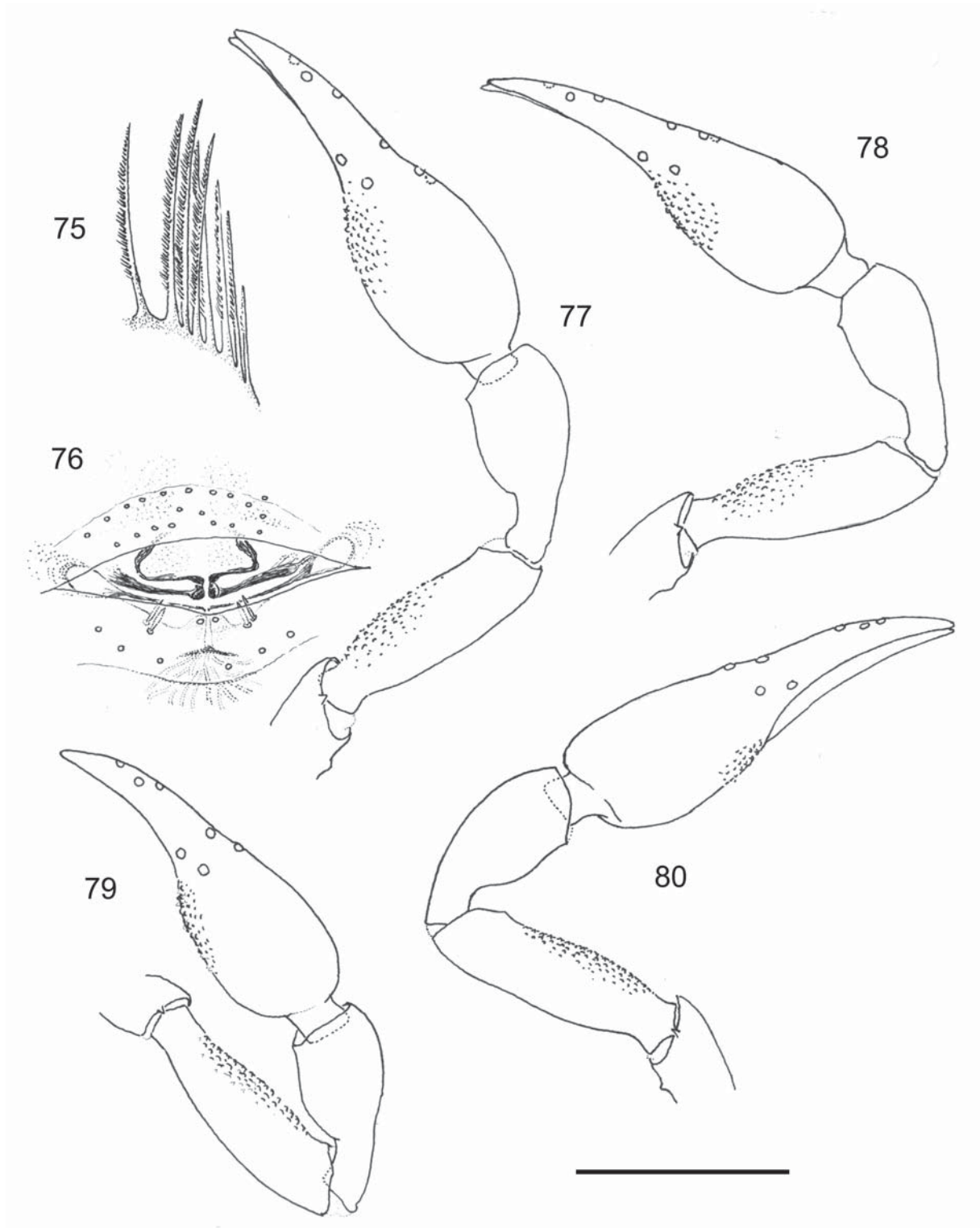
Manducatory process with four longer and one a little shorter seta.

Palp relatively slender (Fig. 82), only femur on anterior face with small faint granulations and, at lateral margin, closer to base, supporting longer and thicker setae than on other parts of pedipalp; proportions: femur 3.79 (♀), 3.14 (P), 3.47 (D) or 3.72 (T) times as long as broad; patella 2.81 (♀), 2.29 (P), 2.35 (D) or 2.52 (T) times as long as broad; chela with pedicel 3.66 (♀), 3.7 (P), 3.9 (D) or 3.63 (T) times as long as broad; hand with pedicel 1.93 (♀) times as long as broad.

Pedicel of chela with numerous tiny pores; chela with dentition and trichobothriotaxy as illustrated (Fig. 81); fixed and movable fingers each with 71 teeth.

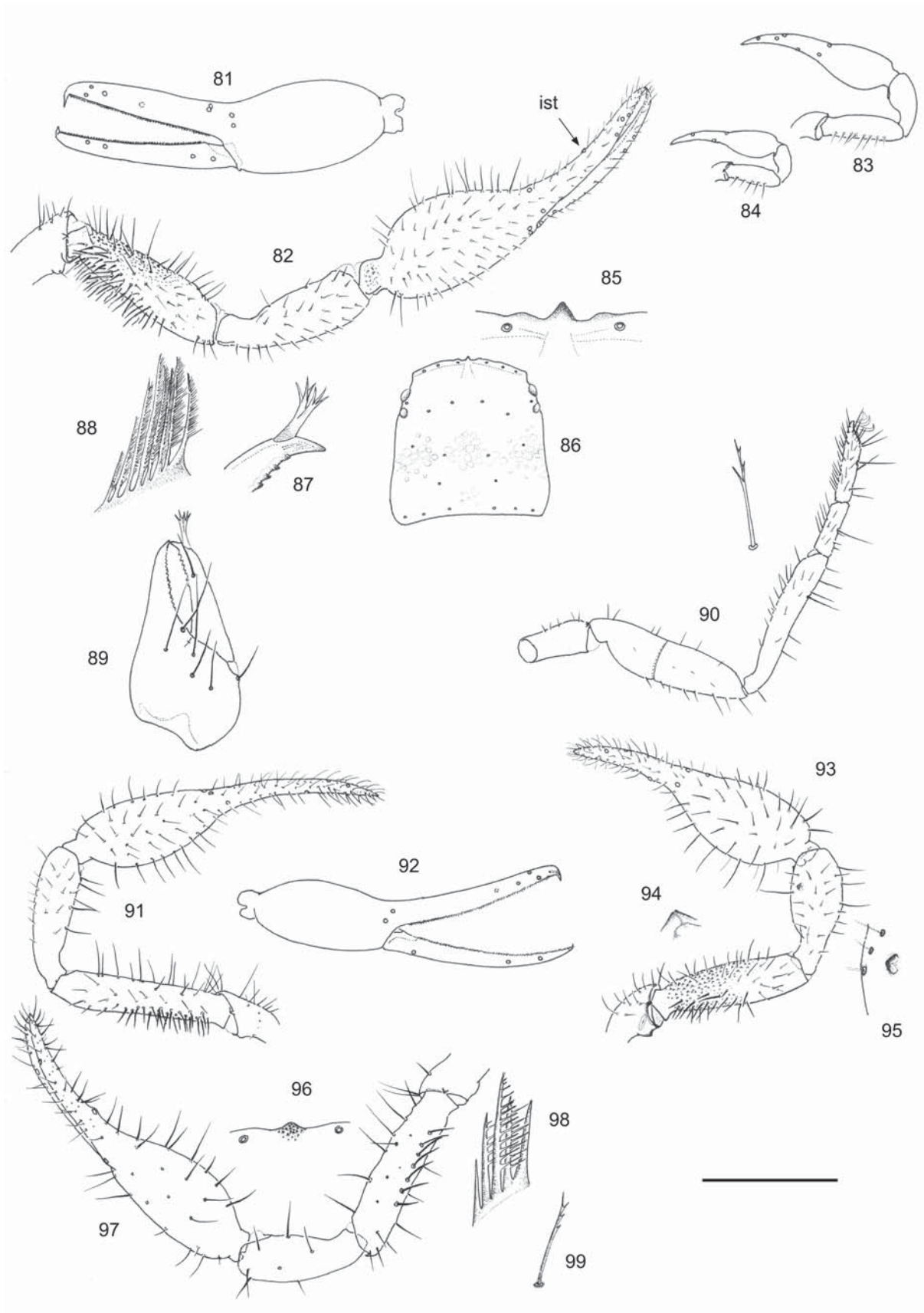
Legs IV typical (Fig. 90); proportions (♀): femur+patella 3.88 times as long as deep; tibia 6.74 times as long as deep; basitarsus 3.69 times as long as deep; telotarsus 4.17 as long as deep.

Measurements (length/breadth, in mm). Carapace 1.17/1.18. Palp: femur (♀) 1.48/0.39, (P) 0.44/0.14, (D) 0.66/0.19, (T) 1.04/0.28; patella (♀) 1.18/0.42, (P) 0.32/0.14, (D)



Figs 75–80. *Bisetocreagris klapperichi* (Beier, 1959): 75, 77, 78 — from Bumburet: 75 — flagellum, ♂; 77 — right palp, dorsal view, ♂; 78 — right palp, dorsal view, ♀; 76, 80 — from Naran: 76 — genital area, ventral view, ♂; 80 — left palp, dorsal view, ♀; 79 — right palp, dorsal view, ♂ from Chitral. Scale: 0.25 (76) and 0.5 mm (77–80).

Рис. 75–80. *Bisetocreagris klapperichi* (Beier, 1959): 75, 77 и 78 — из Бумбурета: 75 — флагеллум, ♂; 77 — правая пальпа, вид сверху, ♂; 78 — правая пальпа, вид сверху, ♀; 76, 80 — из Нарана: 76 — гениталии, вид снизу, ♂; 80 — левая пальпа, вид сверху, ♀; 79 — правая пальпа, вид сверху, ♂ из Читрала. Масштаб: 0,25 (76) и 0,5 мм (77–80).



0.47/0.2, (T) 0.77/0.304; chela with pedicel (♀) 2.56/0.7, (P) 0.85/0.23, (D) 1.21/0.31, (T) 1.82/0.502; length of hand with pedicel (♀) 1.35; length of movable finger (♀) 1.48.

Leg IV (♀, length/depth): femur+patella 1.28/0.33; length of patella 0.72; tibia 1.28/0.19; basitarsus 0.48/0.13; telotarsus 0.62/0.13.

Stenohya kashmirensis (Schawaller, 1988)

Figs 93–95.

REDESCRIPTION. To supplement the original description [Schawaller, 1988], the more dense and shorter setation at the lateral margin closer to the base of the palpal femur (Fig. 93), the presence in the medial part of the patella of a large tubercle (Fig. 95) and the median setae observed on sternites VI–VIII are noteworthy.

Palp relatively slender (Fig. 93), only femur on anterior face with small faint granulations at lateral margin and, closer to base, bearing longer and thicker setae compared to other parts of pedipalp; proportions: femur 3.53 times as long as broad; patella 2.47 as long as broad; chela with pedicel 3.48 times as long as broad; hand with pedicel 2.6 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 1.164/0.33; patella 0.96/0.39; chela with pedicel 1.996/0.58; length of hand with pedicel 1.01; length of movable finger 0.99.

REMARKS. The genus *Stenohya* Beier, 1967 is currently known to comprise ten species [Harvey, 1991; Schawaller, 1994, 1995] restricted to Central and Southeast Asia: Afghanistan, ?Middle Asia, North India (Kashmir, Himachal Pradesh), Nepal, southern China (Sichuan), Vietnam and Thailand. Since some of them, including the type species *S. vietnamensis* Beier, 1967, have only been described from immature specimens, a satisfactory identification is very difficult. A comparison of the species based on adult samples with those known from nymphs is about impossible. Not only does this genus require revision, but also it is necessary to amass and study additional material representing various developmental stages. Hence the necessary qualifications adopted here.

Thus, although *S. sp.A* seems to be especially close, both morphologically and geographically, to *S. kashmirensis* (based on male material only), the above Pakistani samples (two females and numerous immatures) differ sufficiently well in size, trichobothriotaxy, fine granulation, rath-

er than tuberculation, of the palpal femur etc. So it seems better to keep them separately.

The situation is even more confused due to the presence in northern India of still one more very similar species described from female material, *S. caelata* (Callaini, 1990). Based on available information [Schawaller, 1988; Callaini, 1990], it might well be that *S. kashmirensis* and *S. caelata* actually represent a single species. Furthermore, at least some of the closer unidentified material (♀♀ and deutonymphs) quoted by Schawaller [1988] can prove to belong to the sympatric/syntopic *S. kashmirensis* as well. However, no formal synonymy is proposed here prior to revision of all relevant material.

A scatterplot (Fig. 100) shows the distribution of most of *Stenohya* species in relation to the length/breadth ratios of the pedipalpal femur, patella and chela with pedicel. The ratios in some species are taken from the literature. The other congeners are neglected because of the apparent troglomorphic traits (*S. chinocavernicola* Schawaller, 1995), the strikingly spinigerous ♂ hand (*S. hamata* (Leclerc & Mahnert, 1988)), the too poor original descriptions (*S. heros* (Beier, 1943) and *S. mahnerti* Schawaller, 1994, of which the latter species can prove to be the same as *S. vietnamensis*).

The scatterplot roughly shows the relations between the species involved. We seem to face three distinct species groups: the “*kashmirensis*-group”, the “*gruberi*-group” and the “*martensi*-group”. The fact that the juvenile-based *S. lindbergi* [1], *S. sp. B* [12] and *S. sp. C* [13] belong to the same cluster with the adult-based *S. gruberi* (Curčić, 1983) is hardly meaningful though.

The confused systematics of *Stenohya* strongly resembles that in *Bisetocreagris* in such characters as the structure of the flagellum, galea and serrula, the chaetotaxy of the genital area, as well as that of both carapace and abdomen not being too helpful in species discrimination. The separation and description of species must only be based on adult material, preferably of both sexes, with consideration of palpal proportions, granulation and trichobothriotaxy.

Stenohya sp. B

Figs 91, 92.

MATERIAL. 1 T — PAK-85/6 PAKISTAN: Hazara, Kaghan (Kāgān) Valley, 1800 m, Ghuwool Valley [16], Makhair forest, stump of *Jubus* covered with fern, 30.VI.1985, leg. S. Vit.

Figs 81–99. *Stenohya* sp. A (81–90), *Stenohya* sp. B, tritonymph (91, 92), *Stenohya kashmirensis* (Schawaller, 1988), paratype ♂ (93–95), and *Stenohya* sp. C, protonymph from Dunga Gali (96–99): 81 — left chela, lateral view, ♀ from Utrot; 82 — right palp, dorsal view, showing tactile seta IST, ♀ from Utrot; 83 — right palp, dorsal view, deutonymph from Utrot; 84 — right palp, dorsal view, protonymph from Utrot; 85 — epistomal area of carapace, dorsal view, ♀ from Utrot; 86 — carapace, dorsal view, ♀ from Utrot; 87 — tip of movable finger of chelicera, showing galea, ♀ from Utrot; 88 — flagellum, ♀ from Utrot; 89 — chelicera, dorsal view, ♀ from Utrot; 90 — leg IV, lateral view, ♀ from Utrot, insertion showing subterminal seta of tarsus IV, ♀ from Utrot; 91 — left palp, dorsal view; 92 — right chela, lateral view; 93 — right palp, dorsal view; 94 — detail of inner femoral “margin”, showing a larger tubercle; 95 — larger tubercle at inner “margin” of patella; 96 — epistomal area of carapace, dorsal view; 97 — left palp, dorsal view; 98 — flagellum; 99 — subterminal seta of tarsus IV. Scale: 1.0 (81–84, 86, 90–93), 0.5 (89, 97) and 0.25 mm (85, 87, 96).

Рис. 81–99. *Stenohya* sp. A (81–90), *Stenohya* sp. B, тритонимфа (91, 92), *Stenohya kashmirensis* (Schawaller, 1988), паратип ♂ (93–95), и *Stenohya* sp. C, протонимфа из Дунга Гали (96–99): 81 — левая хела, вид сбоку, ♀ из Утрота; 82 — правая пальпа, вид сверху, показана тактильная щетинка IST, ♀ из Утрота; 83 — правая пальпа, вид сверху, дейтонимфа из Утрота; 84 — правая пальпа, вид сверху, протонимфа из Утрота; 85 — район эпистома карапакса, вид сверху; 86 — карапакс, вид сверху, ♀ из Утрота; 87 — вершина подвижного пальца хелицеры, показана галеа, ♀ из Утрота; 88 — флагеллум, ♀ из Утрота; 89 — хелицера, вид сверху, ♀ из Утрота; 90 — нога IV, вид сбоку, ♀ из Утрота, внутри показана субтерминальная щетинка лапки IV; 91 — левая пальпа, вид сверху; 92 — правая хела, вид сбоку; 93 — правая пальпа, вид сверху; 94 — деталь строения внутреннего “края” бедра, показан крупный бугорок; 95 — крупный бугорок на внутреннем “крае” колена; 96 — район эпистома карапакса, вид сверху; 97 — левая пальпа, вид сверху; 98 — флагеллум; 99 — субтерминальная щетинка лапки IV. Масштаб: 1,0 (81–84, 86, 90–93), 0,5 (89, 97) и 0,25 мм (85, 87, 96).

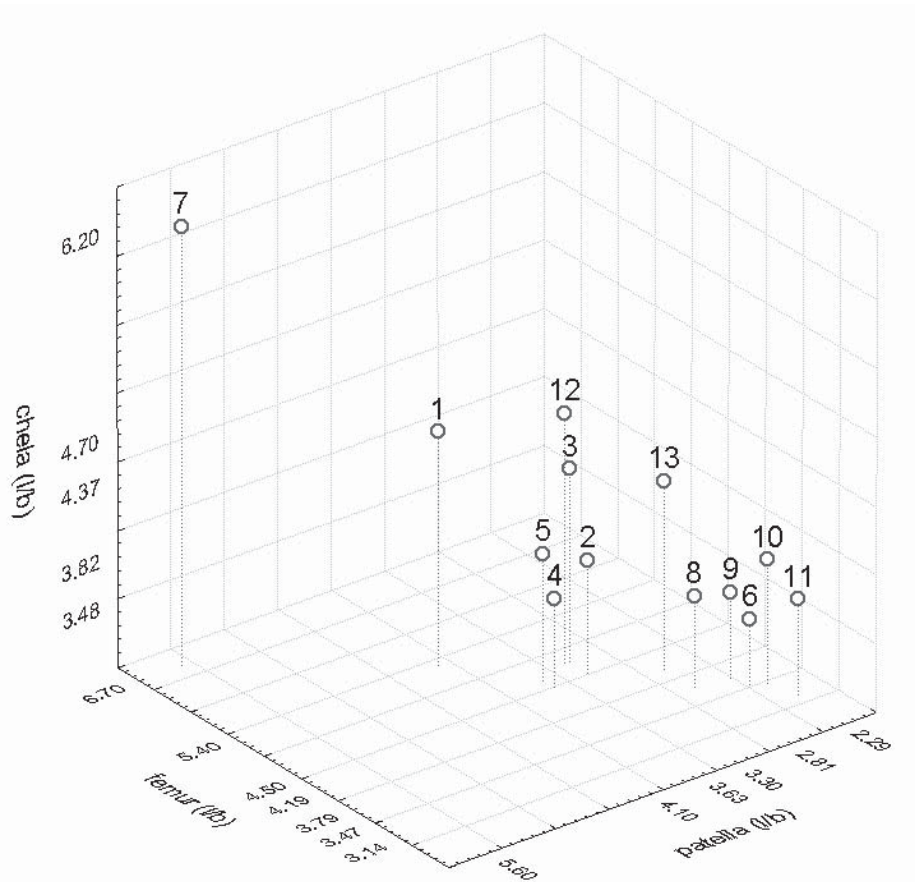


Fig. 100. 3D scatterplot of length/breadth ratios of pedipalp femur, patella and chela with pedicel in *Stenohya* species: 1 — *S. lindbergi*, tritonymph (after Beier [1959]); 2 — *S. gruberi*, ♀ (after Curčić [1983]); 3 — *S. gruberi*, ♂ (after Curčić [1983]); 4 — *S. caelata*, ♀ (after Callaini [1990]); 5 — *S. caelata*, ♀ (after Callaini [1990]); 6 — *S. kashmirensis*, ♂ paratype; 7 — *S. martensi*, ♂ (after Schawaller [1987]); 8 — *S. sp. A*, ♀ from Utrota; 9 — *S. sp. A*, tritonymph from Utrota; 10 — *S. sp. A*, deutonymph from Utrota; 11 — *S. sp. A*, protonymph from Utrota; 12 — *S. sp. B*, tritonymph from Ghuwool Valley; 13 — *S. sp. C*, protonymph from Dunga Gali.

Рис. 100. Трехмерный граф пропорций длины/ширины бедра, колена и хелы педипальпы у видов *Stenohya*: 1 — *S. lindbergi*, тритонимфа (по Beier [1959]); 2 — *S. gruberi*, ♀ (по Curčić [1983]); 3 — *S. gruberi*, ♂ (по Curčić [1983]); 4 — *S. caelata*, ♀ (по Callaini [1990]); 5 — *S. caelata*, ♀ (по Callaini [1990]); 6 — *S. kashmirensis* (Schawaller, 1988), ♂ паратип; 7 — *S. martensi*, ♂ (по Schawaller [1987]); 8 — *S. sp. A*, ♀ из Утрота; 9 — *S. sp. A*, тритонимфа из Утрота; 10 — *S. sp. A*, дейтонимфа из Утрота; 11 — *S. sp. A*, протонимфа из Утрота; 12 — *S. sp. B*, тритонимфа из долины Гувул; 13 — *S. sp. C*, протонимфа из Дунга Гали.

DESCRIPTION. Carapace, palps, tergites and sternites light yellowish. Carapace smooth, anterior margin a little impressed in middle, 1.23 times longer than broad. Epistomal process small, tuberculiform with minute denticles.

Surface of tergites and sternites smooth. Pleural membranes granulostriate.

Chelicera of typical facies. Palp slender (Fig. 91), all segments smooth; femur on lateral face, closer to base, bearing longer and thicker setae than on other parts of pedipalp; proportions: femur 4.79 times as long as broad; patella 3.34 times as long as broad; chela with pedicel 4.82 times as long as broad; hand with pedicel 2.25 times as long as broad.

Chela with dentition and trichobothriotaxy as illustrated (Fig. 92); fixed and movable fingers with 77(!) teeth each.

Measurements (length/breadth, in mm). Carapace 1.18/0.96. Palp: femur 1.34/0.28; patella 1.07/0.32; chela with pedicel 2.46/0.51; length of hand with pedicel 2.25; length of movable finger 1.40.

REMARK. The above specimen is very close to *S. lindbergi* (Beier, 1959), but a more precise identification is hardly possible. The size of the animal is strikingly large, especially so for a tritonymph.

Stenohya sp. C

Figs 96–99.

MATERIAL. 1 P — PAK-84/18, Hazara, Dunga Gali [27], 2300 m, dead leaves and gravel, 22.IV.1984, leg. S. Vit.

DESCRIPTION. Carapace smooth, anterior margin impressed in middle, with 24 setae, anterior margin with four setae, posterior margin with six setae; four well-developed eyes present. Epistomal process small but distinct, tuberculiform with minute denticles.

Surface of tergites and sternites smooth. Pleural membranes granulostriate. Tergal chaetotaxy — 6:6:6:6:6:6:6:6:6:4:2. Chelicera of typical facies; flagel-

lum with five blades, only central three pinnate. Fixed finger of chelicera with 15 teeth, movable finger with five teeth.

Palp relatively slender (Fig. 97), all segments smooth, femur on anterior face with small faint granulations and, at lateral margin closer to base, with seven longer and thicker setae than on other parts of pedipalp; proportions: femur 4.19 times as long as broad; patella 2.82 times as long as broad; chela with pedicel 4.37 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 0.67/0.16; patella 0.46/0.17; chela with pedicel 1.18/0.2.

REMARK. The large size of the protonymph is also quite striking.

Stenohya sp.

MATERIAL. 1 D — PAK-85/20, Hazara, Kaghan (Kāgān) Valley, Naran [25], Lake Saiful Muluk, 3100 m, humus of *Saxifraga* (?), 4–5.VII.1985, leg. S. Vit; 5 DD — 17b, Swat, Malam Jabba [12], 2500–2600 m, sifted dead leaves and moss in *Abies* forest, 18.V.1983; 1 D — 15c, Swat, above Miandam [7], 2400–2500 m, *Abies* forest, sifted litter, 17.V.1983; 1 D — 6c, Swat, above Miandam [7], 2300 m, sifting near foot of *Abies* stump, 10.V.1983; 4 DD — 4c, Swat, Malam Jabba [12], sifting in *Pinus* forest, at foot of *Pinus* and *Juglans* trees, 2300 m, 9.V.1983; 1 T — 33d, Hazara, above Naran [28], side valley, 2600 m, sifted dead leaves and branches rotting under *Castanea* tree, 1.VI.1983; 1 D — 40, Punjab, Murree [1], 2100 m, sifted dead leaves in broad-leaved forest with *Pinus*, 5.VI.1983; 1 D, 1 P — 4b, Swat, Malam Jabba [12], sifted grass, moss, *Polyporus* and rotten wood, 2400 m, 9.V.1983, all leg. Cl. Besuchet & I. Löbl.

Family CHEIRIDIIDAE H.J. Hansen, 1893

Cheiridium minor J.C. Chamberlin, 1938

Figs 113–118.

MATERIAL. 1 ♂, 1 ♀ — PAK-85/12, Hazara, Kaghan (Kāgān) Valley, Malkandi forest [17], under *Cedrus* bark, 1.VII.1985; 1?, 1 T, 2 PP — PAK-84/14, Hazara, Kaghan (Kāgān) Valley, Malkandi [17], 1350 m, dry bark and dead wood (*Acer?*), 20.IV.1984; 1 ♂ — PAK-85/24, Hazara, Kaghan (Kāgān) Valley, Malkandi forest [17], 450 m, old stump of broad-leaved tree and in rodent nest, 6.VII.1985; 1 ♀ — PAK-84/11, Hazara, Kaghan (Kāgān) Valley, Malkandi [17], 1350 m, 19.IV.1984; 1 T — PAK-84/22, Punjab, Murree [1], 1950 m, litter near *Aesculus*, 23.IV.1984, all leg. S. Vit.

DESCRIPTION. MALE, FEMALE (from Hazara — PAK-85/12). Carapace slightly (1.26 (♂) or 1.28 (♀) times) broader than long; anterior margin with denticulo clavate setae (Fig. 118). Chelicera: basal part with four setae, basal seta as in Fig. 117; flagellum with 4 (!) blades, anterior one large, without denticles.

Palp with trichobothriotaxy as illustrated (Figs 113 & 114). Trichobothrium EST at the same level as IT. Palp with well-developed granulation and with denticulo clavate setae on the dorsal face of femur, patella and hand; proportions: femur 4.5 (♂) or 5.17 (♀) times as long as broad; patella 2.88 (♂, ♀) times as long as broad; chela with pedicel 3.55 (♂) or 3.41 (♀) times as long as broad.

Measurements (length/breadth, in mm). Total length: 0.91 (♂), 0.97 (♀). Carapace: 0.27/0.34 (♂), 0.29/0.37 (♀) Palp: femur 0.27/0.06 (♂), 0.31/0.06 (♀); patella 0.23/0.08 (♂ and ♀); chela with pedicel 0.39/0.11 (♂), 0.41/0.12 (♀); length of movable finger 0.21 (♂), 0.22 (♀).

REMARKS. The attribution of the above material to *C. minor* allows to draw several conclusions. First of all, this

shows that *C. minor* is a valid species, whereas treating [e.g. Schawaller, 1995: 1056] *C. minor* as a junior synonym of *C. museorum* (Leach, 1817) is incorrect. As the above characters show, both the forms differ quite clearly. In particular, the vestitural setae in *C. minor* are denticulo clavate, as opposed to acuminate with a spinule in the middle in *C. museorum*. In addition, their trichobothriotaxy is different. Thus, ET in *C. minor* is located distally, while EST and IT lie almost at the same level. In *C. museorum*, however, IT and ET are positioned at the same level, while EST lies a little more proximally. There are also distinctions in the shape of setae of the flagellum and in the basal seta of the chelicera. All these characters and, above all, the size and proportions of the palp, allow to unequivocally distinguish these two species. Although some of these traits seem sufficiently strongly variable infraspecifically [e.g. Mahnert, 1982, 1984], the peculiar trichobothriotaxy (IT, ET, EST) and some other features allowed Chamberlin [1938] to place *C. minor* in separate subgenus, *Isocheiridium* Chamberlin, 1938. Even though Hoff & Clawson [1952] considered *Isocheiridium* as a junior subjective synonym of *Cheiridium* s.str., in any other family the fact that so many important characters allow to distinguish two species could provoke the erection of a new genus to separate them. This shows once again the poor state of the art concerning pseudoscorpion systematics at the generic level.

Finally, Curcic [1980b] described *Cheiridium nepalense* Curcic, 1980 from the Himalayas of Nepal. Based on the original description alone, *C. nepalense* appears to be so very similar to *C. minor* that most likely these names will prove to be synonyms. However, to confirm or reject this, a (re)study of type or topotypic material of *C. nepalense* is necessary.

Cheiridium museorum (Leach, 1817)

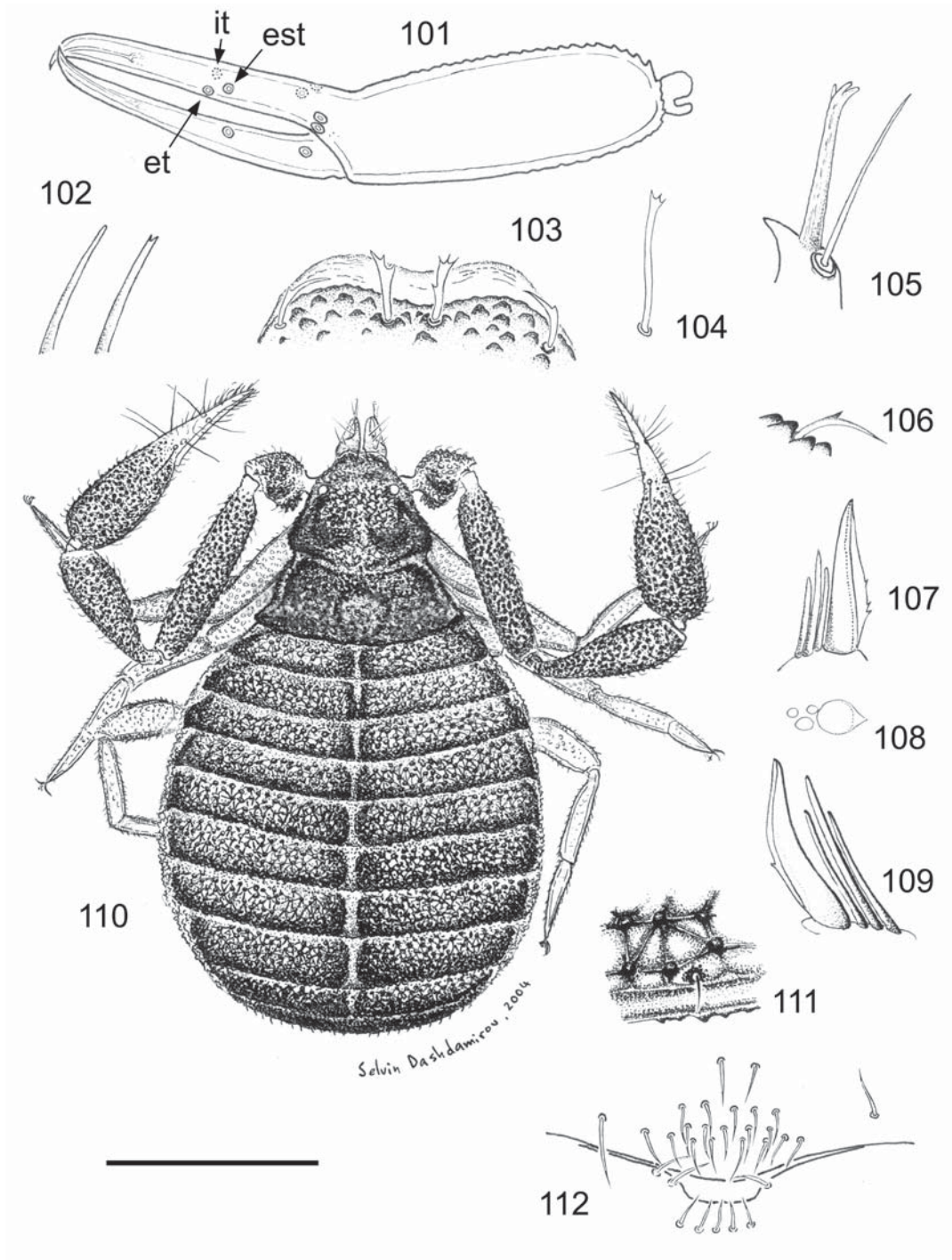
Figs 101–112.

MATERIAL. 2 ♂♂, 1 ♀ — 17b, Swat, Malam Jabba [12], 2500–2600 m, sifted dead leaves and moss in *Abies* forest, 18.V.1983; 1 ♂ — 34b, between Naran and Kaghan (Kāgān) [29], 2300 m, sifting under *Populus* bark, 2.VI.1983; 2 ♂♂, 2 ♀♀, 1 T — 6c, Swat, above Miandam [7], 2300 m, sifting near foot of *Abies* stump, 10.V.1983, all leg. Cl. Besuchet & I. Löbl; 7 ♂♂, 7 ♀♀, 2 TT, 5 DD — PAK-84/29, Punjab, Murree [1], 1950 m, hole in *Prunus* tree with *Lasius* sp. nest, 25. IV.1984, leg. S. Vit.

DESCRIPTION. MALE, FEMALE (from Swat — 17b). Carapace slightly (1.17 (♂, ♀) times) broader than long; anterior margin with terminally denticulate setae. Chelicera: basal part with four setae, basal seta as in Fig. 104, dentate only terminally; flagellum with 4(!) blades, anterior one large with denticles at anterior margin. Palp with trichobothriotaxy as illustrated (Figs 101 & 110). Trichobothrium IT at the same level as ET. Palp with well-developed granulation, with denticulate setae on dorsal face of femur, patella and hand; proportions: femur 5.11 (♂) or 4.89 (♀) times as long as broad; patella 3.18 (♂) or 3.09 (♀) times as long as broad; chela with pedicel 4.23 (♂) or 4.58 (♀) times as long as broad.

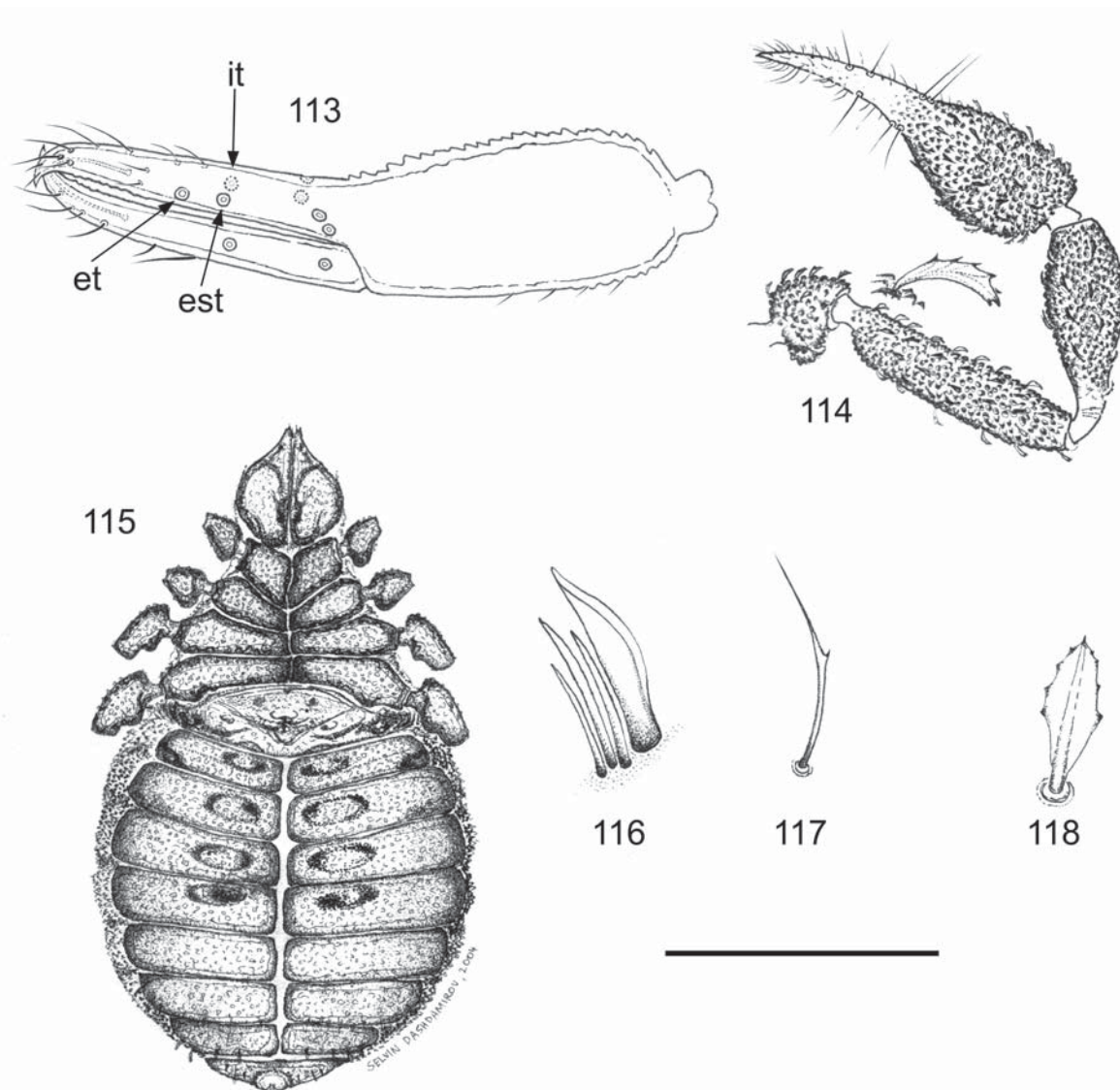
Measurements (length/breadth, in mm). Total length: 1.35 (♂), 1.37 (♀). Carapace: 0.42/0.49 (♂, ♀). Palp: femur 0.46/0.09 (♂), 0.44/0.09 (♀); patella 0.35/0.11 (♂), 0.34/0.11 (♀); chela with pedicel 0.55/0.13 (♂), 0.55/0.12 (♀); length of movable finger 0.30 (♂), 0.27 (♀).

FEMALE (from Murree — PAK-85/29). Carapace 1.51 times broader than long; anterior margin with terminally-



Figs 101–112. *Cheiridium museorum* (Leach, 1817), ♂♂ from Malam Jabba (101, 102, 109, 112), ♀, from Murree (103–108, 110, 111): 101 — left chela, lateral view; 102 — galeae; 103 — anterior margin of carapace; 104 — basal seta of chelicera; 105 — tip of movable finger of chelicera with galea, dorsal view; 106 — vestitural seta of palpal femur; 107 — flagellum; 108 — ventral aspect of flagellum; 109 — flagellum; 110 — body in dorsal view; 111 — tergal skin structure; 112 — operculum, showing chaetotaxy. Scale: 0.5 (110) and 0.18 mm (101).

Рис. 101–112. *Cheiridium museorum* (Leach, 1817): ♂♂ из Малам Джаббы (101, 102, 109, 112), ♀ из Муррее (103–108, 110, 111): 101 — левая хела, вид сбоку; 102 — галеи; 103 — передний край карапакса; 104 — базальная щетинка хелицеры; 105 — вершина подвижного пальца хелицеры с галеей, вид сверху; 106 — покровная щетинка с бедра пальпы; 107 — флагеллум; 108 — флагеллум, вид снизу; 109 — флагеллум; 110 — общий вид, сверху; 111 — структура поверхности тергитов; 112 — оперкулум, показана хетотаксия. Масштаб: 0,5 (110) и 0,18 мм (101).



Figs 113–118. *Cheiridium minor* J.C. Chamberlin, 1938, from Malkandi, ♂ (113–115), ♀ (116–118): 113 — left chela, lateral view; 114 — right palp, dorsal view, insertion showing vestiture of femur; 115 — body in ventral view, without legs and palps; 116 — flagellum; 117 — basal seta of chelicera; 118 — setae at anterior margin of carapace. Scale bar: 0.2 (113), 0.3 (114) and 0.42 mm (115).

Рис. 113–118. *Cheiridium minor* J.C. Chamberlin, 1938, из Малканди, ♂ (113–115), ♀ (116–118): 113 — левая хела, вид сбоку; 114 — правая пальпа, вид сверху, внутри показана покровная щетинка бедра; 115 — общий вид снизу, без ног и педипальп; 116 — флагеллум; 117 — базальная щетинка хелицеры; 118 — щетинка с переднего края карапакса. Масштаб: 0,2 (113), 0,3 (114) и 0,42 мм (115).

denticulate setae (Fig. 103). Palp proportions: femur 5.49–5.67 times as long as broad; patella 2.41–3.09 times as long as broad; chela with pedicel 3.81–4.07 times as long as broad.

Measurements (length/breadth, in mm). Total length: 1.38. Carapace: 0.43/0.65. Palp: femur 0.51/0.09–0.093; patella 0.37–0.39/0.12–0.16; chela with pedicel 0.594–0.61/0.15–0.16; length of movable finger 0.29–0.3.

REMARK. If one compares these examples with the “typical” *C. museorum*, both a larger size and a more intense pigmentation are noteworthy. Nevertheless, based on palpal proportions alone, these specimens are referred to *C. museorum*.

Family ATEMNIDAE J.C. Chamberlin, 1931

Atemnus politus (E. Simon, 1878)

MATERIAL. 3 ♂♂, 5 ♀♀, 7 TT, 2 DD — 13b, Swat, Ushu Valley [21], upstream of Kalam, 2300 m, litter under bushes resembling hazel, *Cedrus* forest, 15.V.1983; 5 ♂♂, 12 ♀♀, 10 TT, 2 DD, 1 P — 9b, Swat, Kalam [8], 2100 m, sifted dead leaves in *Quercus* grove, 12.V.1983; 1 ♂ — 25a, Chitral, above Bumburet in valley leading to Ustui Pass [30], under stones and excrements, 2500 m, 25.V.1983; 2 ♀♀, 1 T — 23, Chitral, Lawarai Pass [31], 2600 m, sifting in *Picea* and *Abies* forest with

Cedrus, rotten wood and dead leaves, 23.V.1983; 3 ♂♂, 1 T, 1 D, 1 P — 31a, Chitral, Lotkoh (= Hot Springs) [32], 2350 m, 46 km N of Chitral, under stones, 29.V.1983; 1 ♂ — 24a, Chitral, Bumburet [2], wet gravel along stream, 24.V.1983; 3 ♂♂, 3 ♀♀, 1 T, 6 DD, 3 PP — 26b, Chitral, Bumburet [2], sifted dead leaves and rotten wood in big hollow *Quercus* trees, 2200 m, 24.V.1983, all leg. Cl. Besuchet & I. Löbl.

Atemnus sp.

MATERIAL. 1 T — 25d, Chitral, above Bumburet, in valley leading to Ustui Pass [30], sifting at foot of *Abies* tree, 2700 m, 25.V.1983; 1 T — 23, Chitral, Lawarai Pass [31], 2600 m, sifting in *Picea* and *Abies* forest with *Cedrus*, rotten wood and dead leaves, 23.V.1983, all leg. Cl. Besuchet & I. Löbl.

Family CHELIFERIDAE Risso, 1826

Dactylochelifer brachialis Beier, 1952 Figs 119–129.

MATERIAL. 16 ♂♂, 21 ♀♀, 4 TT — PAK-85/1, Gilgit [4], bank of Gilgit River, under stones, 26.VI.1985, leg. S. Vit; 6 ♂♂, 4 ♀♀, 6 DD — 31a, Chitral, Lotkoh (= Hot Springs) [32], 2350 m, 46 km N of Chitral, under stones, 29.V.1983, leg. Cl. Besuchet & I. Löbl.

DESCRIPTION. MALE, FEMALE (from Gilgit — PAK-85/1). *Dactylochelifer* Beier, 1932 of typical facies. Carapace of usual facies, slightly longer than broad, median and posterior furrows prominent, regularly granulate. One pair of true eyes. Flagellum with three blades, anterior one medially denticulate (with four spinules). Tergal scuta sclerotic, vestitural setae short, poorly clavate and denticulate terminally. Tergites I to III with two discal setae, tergites IV to XI with four discal setae (Fig. 119). Median cribriform plate of typical facies, as in Figs 128 & 129.

Palp with trichobothriotaxy as illustrated (Figs 120 & 123). Palp with well-developed granulation; terminal margins of palpal femur and patella strongly denticulate. Proportions: femur 4.05 (♂) or 4.48 (♀) times as long as broad; patella 3.36 (♂) or 3.23 (♀) times as long as broad; chela with pedicel 4.06 (♂) or 3.79 (♀) times as long as broad.

Leg I (♂) as in Figs 124–127: tibia 2.69 times as long as deep; tarsus 2.43 times as long as deep.

Measurements (length/breadth, in mm). Palp: femur 0.89/0.22 (♂), 0.94/0.21 (♀); patella 0.84/0.25 (♂), 0.84/0.26 (♀); chela with pedicel 1.42/0.35 (♂), 1.48/0.39 (♀); length of movable finger 0.69 (♂), 0.72 (♀). Leg I (♂): tibia 0.35/0.13; tarsus 0.34/0.14.

REMARKS. This species is rather easy to diagnose from material of both sexes. In the male, this is the shape of tarsus I and the structure of the genitalia, whereas in the female, this is the conformation of the cribriform plate. In this species, such characters as the proportions of the palp are only poorly suitable for identification.

It is noteworthy that, in dorsal view, the apophysis of tarsus I is not coaxial with the tarsal segment, but it is a little curved on one of the sides (Fig. 124).

Dactylochelifer monticola Beier, 1960 Figs 130–133.

MATERIAL. 1 ♂, 1 ♀, 1 T, 2 DD — 28b, Chitral, above Madaglasht [33], side valley, litter, 3050 m, 27.V.1983, leg. Cl. Besuchet & I. Löbl.

DESCRIPTION. MALE, FEMALE. Median cribriform plate as in Fig. 131. Palp with trichobothriotaxy as illustrated

(Fig. 132). Palp with well-visible granulation; terminal margins of palpal femur and patella denticulate. Proportions: femur 4.18 (♂) or 3.9 (♀) times as long as broad; patella 3.21 (♂) or 3.27 (♀) times as long as broad; chela with pedicel 3.83 (♂) or 3.64 (♀) times as long as broad; hand with pedicel 2.14 (♂) or 1.92 (♀) times as long as broad; hand without pedicel 1.9 (♂) or 1.69 (♀) times as long as broad. Finger 1.05 (♂) or 1.11 (♀) times as long as hand without pedicel.

Leg I (♂) as in Fig. 130: tibia 2.73 times as long as deep; tarsus 3.25 times as long as deep.

Measurements (length/breadth, in mm). Palp: femur 0.71/0.17 (♂), 0.82/0.21 (♀); patella 0.61/0.19 (♂), 0.72/0.22 (♀); chela with pedicel 1.11/0.29 (♂), 1.31/0.36 (♀); length of hand with pedicel 0.62 (♂), 0.69 (♀); length of hand without pedicel 0.55 (♂), 0.61 (♀), length of movable finger 0.58 (♂), 0.68 (♀). Leg I (♂): tibia 0.3/0.11; tarsus 0.26/0.08.

REMARKS. Though the shape of tarsus I in *D. monticola* shows no differences to that in *D. intermedius*, the structure of both male and female genitalia [cp. Dashdamirov & Schawaller, 1995: figs 56–60] proves that *D. monticola* is a valid species. In particular, the dorsal apodemes of the ♂ genitalia are longer, versus very short in *D. intermedius*. On the other hand, the lateral rods in both species are rather similar. The median cribriform plate in the female of *D. monticola* is subspherical in form, with short spinules scattered over the surface. In addition, the relatively small size of the palps and their somewhat different proportions are noteworthy.

Dactylochelifer intermedius Redikorzev, 1949 Figs 134, 135.

MATERIAL. 3 ♂♂, 1 T — 11c, Swat, above Utrot [19], *Abies* forest with *Cedrus*, sifted rotten wood, 2800 m, 13.V.1983, leg. Cl. Besuchet & I. Löbl.

DESCRIPTION. MALE. Palp with trichobothriotaxy as illustrated (Fig. 135), with well-developed but fine granulation; terminal margins of palpal femur and patella weakly denticulate. Proportions: femur 3.73 times as long as broad; patella 3.03 times as long as broad; chela with pedicel 3.5 times as long as broad; hand with pedicel 2.01 times as long as broad.

Leg I (♂) as in fig. 134: tibia 2.95 times as long as deep; tarsus 3.79 times as long as deep; subterminal setae are simple.

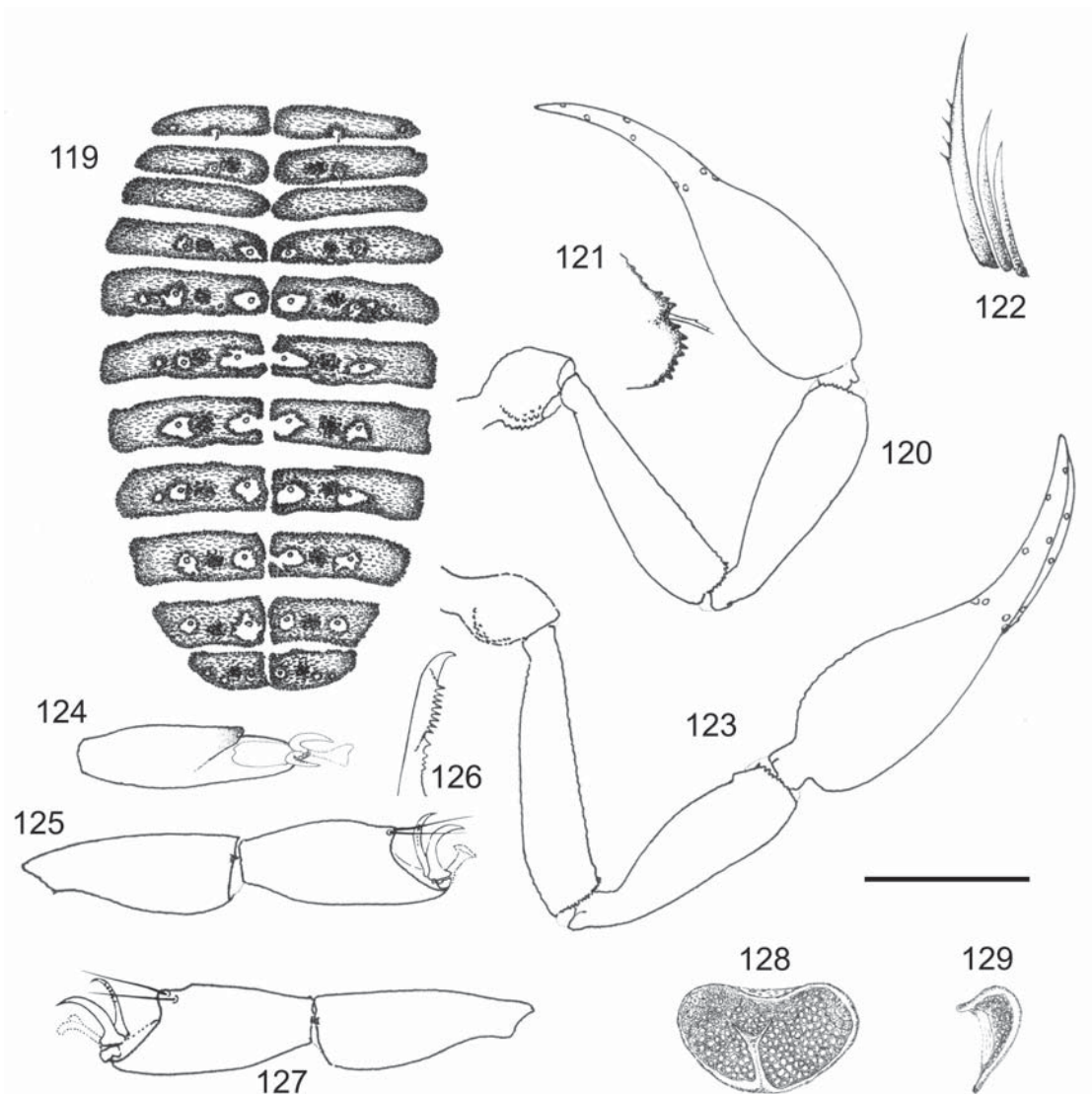
Measurements (length/breadth, in mm). Palp: femur 0.85/0.23; patella 0.76/0.25; chela with pedicel 1.29/0.37; length of hand 0.68. Leg I (♂): tibia 0.354/0.12; tarsus 0.33/0.09.

REMARKS. The earlier assumption [Dashdamirov & Schawaller, 1995: 11] that *D. intermedius* represents one of the extreme cases in the wide variation range of the „*beieri*“ group, with the central species *D. beieri* Redikorzev, 1932 described from Uzbekistan, still remains valid. The only exception seems to be *D. monticola* Beier, 1960, which must simply be excluded from this species group (see below). As regards the above Pakistani samples, they agree completely with the other conspecific material from Central Asia [Dashdamirov & Schawaller, 1995].

Dactylochelifer sp.

MATERIAL. 1 ♀ — 28d, Chitral, above Madaglasht [33], side valley, litter, 2950 m, 27.V.1983, leg. Cl. Besuchet & I. Löbl.

REMARKS. This female could not be identified, since a secure identification requires male material to reveal the species-specific shape of tarsus I. As the subterminal seta on the tarsi is simple, not serrate, and



Figs 119–129. *Dactylochelifer brachialis* Beier, 1952, from Gilgit, ♂♂ (119–122, 124–127), ♀♀ (123, 128, 129): 119 — scutum of tergites; 120 — right palp, dorsal view; 121 — distal part of palpal femur, showing denticulation of margin and seta; 122 — flagellum; 123 — right palp, dorsal view; 124 — tarsus IV, dorsal view; 125 — tarsus and tibia IV, lateral view; 126 — claw, showing tiny teeth at internal margin; 127 — tarsus and tibia IV, lateral view; 128 — cribriform plate, dorsal view; 129 — cribriform plate, lateral view. Scale: 0.5 (119, 120, 123) and 0.25 mm (121, 124, 125, 127).

Рис. 119–129. *Dactylochelifer brachialis* Beier, 1952 из Гилгита, ♂♂ (119–122, 124–127), ♀♀ (123, 128, 129): 119 — скutum тергитов; 120 — правая пальпа, вид сверху; 121 — дистальная часть бедра пальпы, показаны зазубренность края и щетинка; 122 — флагеллум; 123 — правая пальпа, вид сверху; 124 — лапка IV, вид сверху; 125 — лапка и голень IV, вид сбоку; 126 — коготок, показаны мелкие зубчики на внутреннем крае; 127 — лапка и голень IV, вид сбоку; 128 — ситовидная пластинка, вид сверху; 129 — ситовидная пластинка, вид сбоку. Масштаб: 0,5 (119, 120, 123) и 0,25 мм (121, 124, 125, 127).

the median cribriform plate is unpaired, this sample is assigned to *Dactylochelifer*.

Family CHERNETIDAE Menge, 1855

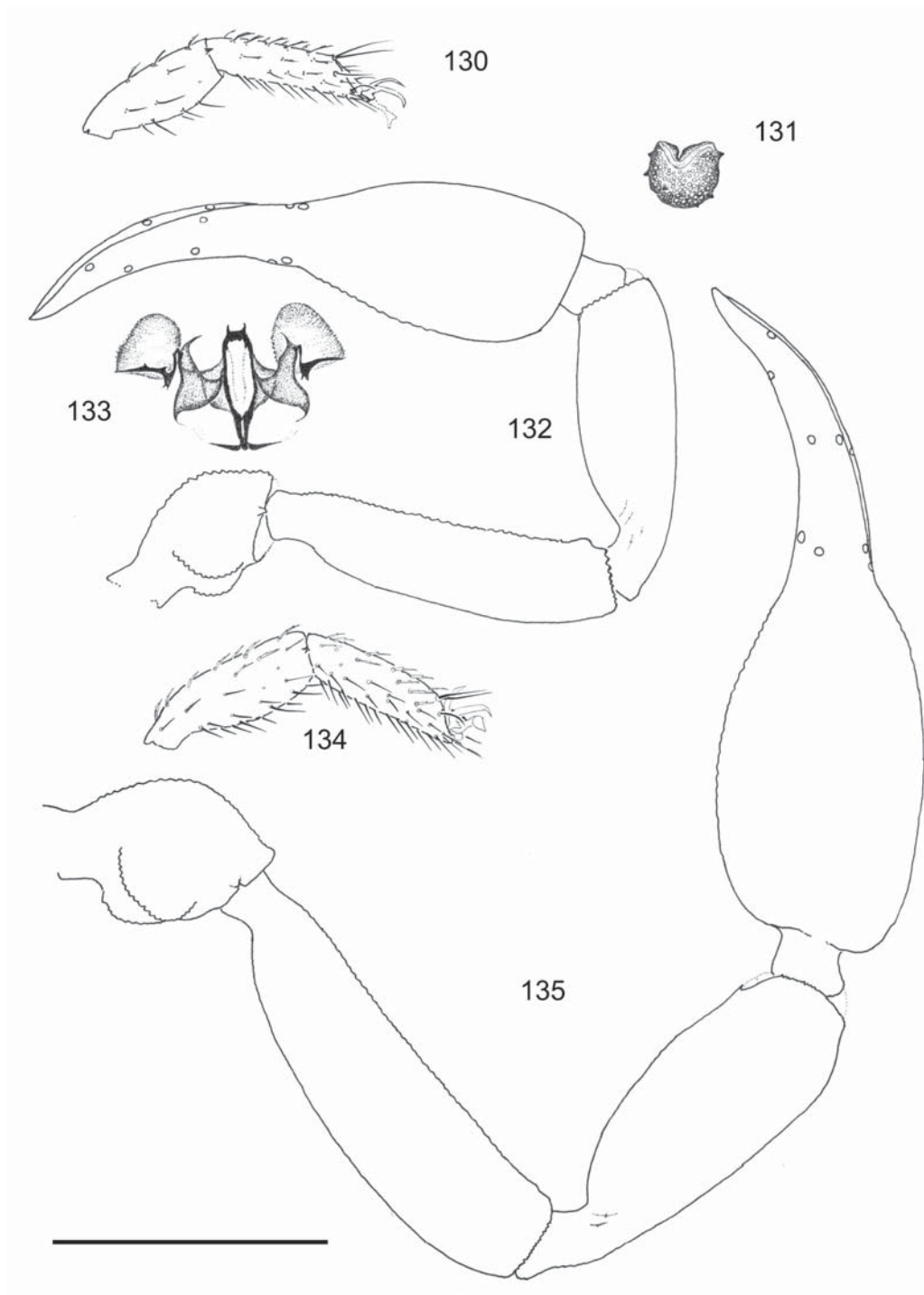
Allochernes loebli sp.n.

Figs 136–147.

MATERIAL. Holotype ♂ — 28d, Chitral, above Madaglasht [33], side valley, litter, 2950 m, 27.V.1983, leg. Cl. Besuchet & I. Löbl. Paratype ♀, same data as holotype.

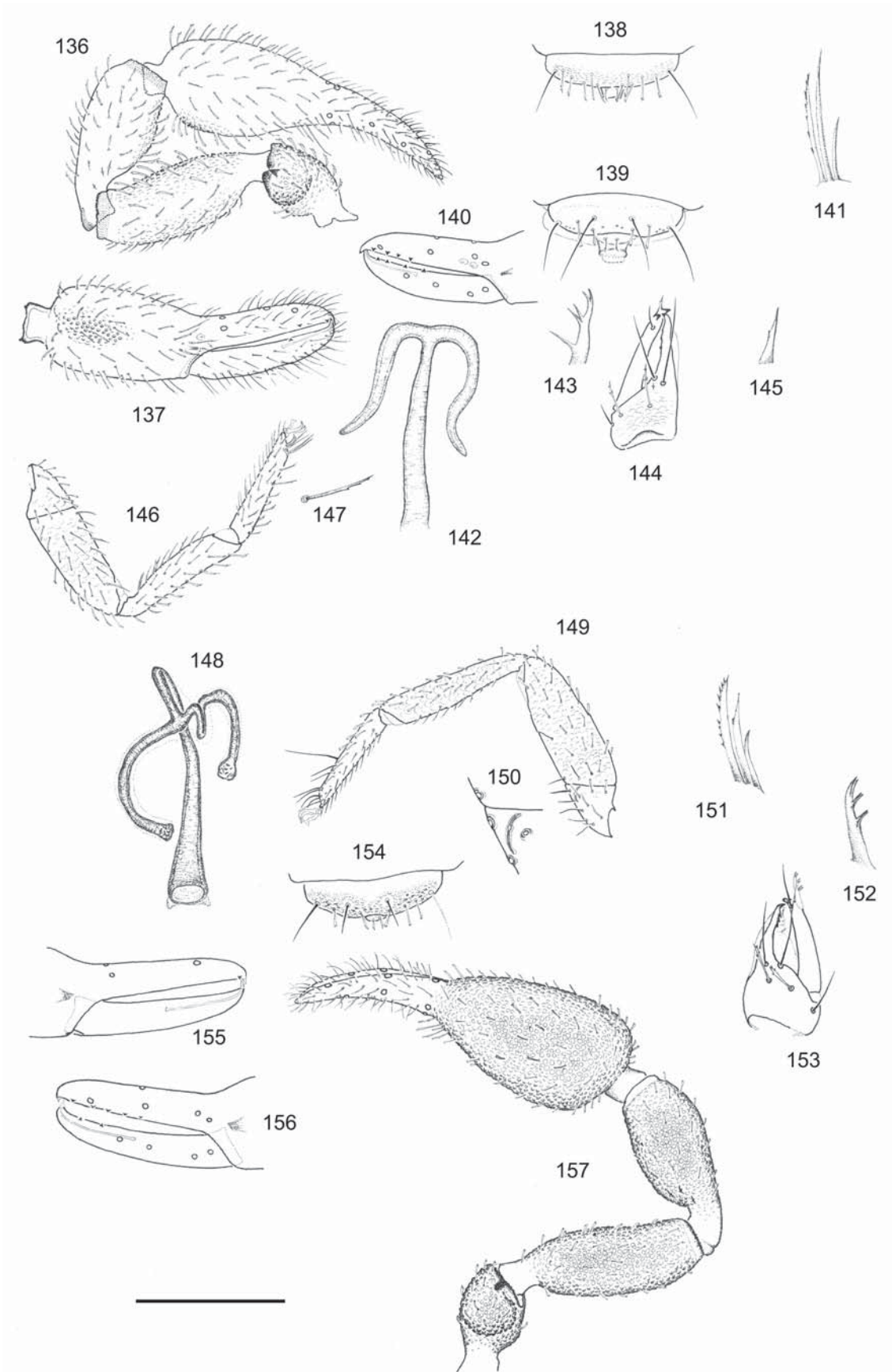
OTHER MATERIAL. 1 ♀ — 11 D, Swat, above Utrot [19], *Abies* forest with *Cedrus*, sifted moss with a little of rotten wood, 2600 m, 13.V.1983, leg. Cl. Besuchet & I. Löbl.

DESCRIPTION. MALE (holotype; Figs 136–138, 144–147). Vestitural setae long, prominently denticuloclavate. Carapace 1.394 times longer than broad, of usual shape; two transverse furrows deep and distinct. Tergal chaetotaxy: 17:17:19:21:23:22:21:24:24:22:12(10 + 2 long tactile setae):2(short but denticulate terminally). Manducatory process with one apical seta and two subapical, rather long setae. Chaetotaxy of sternites: x:37:12:14:24:26:25:



Figs 130–135. *Dactylochelifer monticola* Beier, 1960, from Madaglasht (130–133), *Dactylochelifer intermedius* Redikorzev, 1949, ♂ from Utrot (134, 135): 130 — tarsus and tibia, lateral view, ♂; 131 — cribriform plate, ♀; 132 — right palp, dorsal view, ♂; 133 — genitalia ♂, dorsal view; 134 — tarsus and tibia IV, lateral view; 135 — right palp, dorsal view. Scale: 0.5 mm (130, 132, 134, 135).

Рис. 130–135. *Dactylochelifer monticola* Beier, 1960, из Мадагласхта (130–133), *Dactylochelifer intermedius* Redikorzev, 1949, ♂ из Утрота (134, 135): 130 — лапка и голень IV, вид сбоку, ♂; 131 — ситовидная пластинка, ♀; 132 — правая пальпа, вид сверху, ♂; 133 — гениталии ♂, вид сверху; 134 — лапка и голень IV, вид сбоку; 135 — правая пальпа, вид сверху. Масштаб: 0,5 мм (130, 132, 134, 135).



25:23:20:9 (5+4 long tactile setae):2; each sternite with relatively few small pores.

Chelicera in basal part with faint net-like reticulation dorsally; five setae in basal part, B and SB incrassate and denticulate terminally; movable finger with a seta distad of midway of finger; serrula exterior with 18 lamellae; flagellum with three blades, anterior one weakly denticulate (7 spinules) distally. Galea with a subterminal spinule. Fixed finger with three small subapical teeth.

Palp with trichobothriotaxy as illustrated (Figs 136 & 137). Vestitural setae of trochanter and both on medial and dorsal faces of femur, patella and hand incrassate and variously denticuloclavate, all others more or less acuminate. Palp relatively robust, fingers rather thick in dorsal view, especially so closer to base. Granulation and proportions: femur with weak granulation, 2.8 times as long as broad; patella with granulation only medially, 2.153 as long as broad; chela with weak granulation only on medial face closely to proximal part of hand, with pedicel 3.42 times as long as broad; hand with pedicel 1.89 times as long as broad. Fixed finger of chela with 37 marginal teeth and with four external and two internal accessory teeth; movable finger with 36 marginal teeth, four external and only one internal accessory tooth. Both fingers with few pores (sensory spots). Venom duct not elongate, nodus ramosus close to T.

Leg IV of typical chernetine facies (Fig. 146), moderately slender, without tactile setae, but with numerous, rather long, denticulate setae; proportions: femur+patella 3.573 times as long as deep; tibia 4.85 times as long as deep; tarsus 5.87 times as long as deep.

Measurements (length/breadth, in mm). Carapace 0.77/0.552. Palp: femur 0.64/0.23; patella 0.59/0.274; chela with pedicel 1.074/0.314; length of hand with pedicel 0.594; length of movable finger 0.54. Leg IV: femur+patella 0.59/0.164; tibia 0.48/0.099; tarsus 0.4/0.07.

DESCRIPTION. FEMALE (paratype and ♀ non-type from Utrot (in square brackets, []; Figs 139–143)). Galea strongly different from male one, with very long three subterminal and two terminal branches. Tergal chaetotaxy: 16:18:14:19:20:24:19:21:21:19:10 (8 + 2 long tactile setae):2 (short, but denticulate terminally). Chaetotaxy of sternites: x:20:9:6:20:24:25:23:22:18:8 (4+4 long tactile setae):2. Spermatheca as illustrated (Fig. 142).

Palpal proportions: femur 2.83 times as long as broad; patella 2.453 times as long as broad; chela with pedicel 3.59 [3.71] times as long as broad; hand with pedicel 1.87 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 0.63/0.22; patella 0.584/0.24; chela with pedicel 1.084/0.302 [1.076/0.29]; length of hand with pedicel 0.57; length of movable finger 0.52.

DIAGNOSIS. The new species differs from other members of *Allochernes* Beier, 1932 in the rather peculiar pattern of granulation of the chelal hand. Here the granulation covers only the medial surface, closer to the proximal part. Based on other features, this species seems particularly close to the Central Asian group of species that includes *A. elbursensis* Beier, 1969 from Iran, *A. tucanus* Beier, 1959 from Pakistan and *A. brevopilosus* Beier, 1967 from Afghanistan.

Allochernes minor sp.n.

Figs 164–172.

MATERIAL. Holotype ♀ — PAK-84/22, Punjab, Murree [1], litter near *Aesculus*, 1950 m, 23.IV.1984, leg. S. Vit.

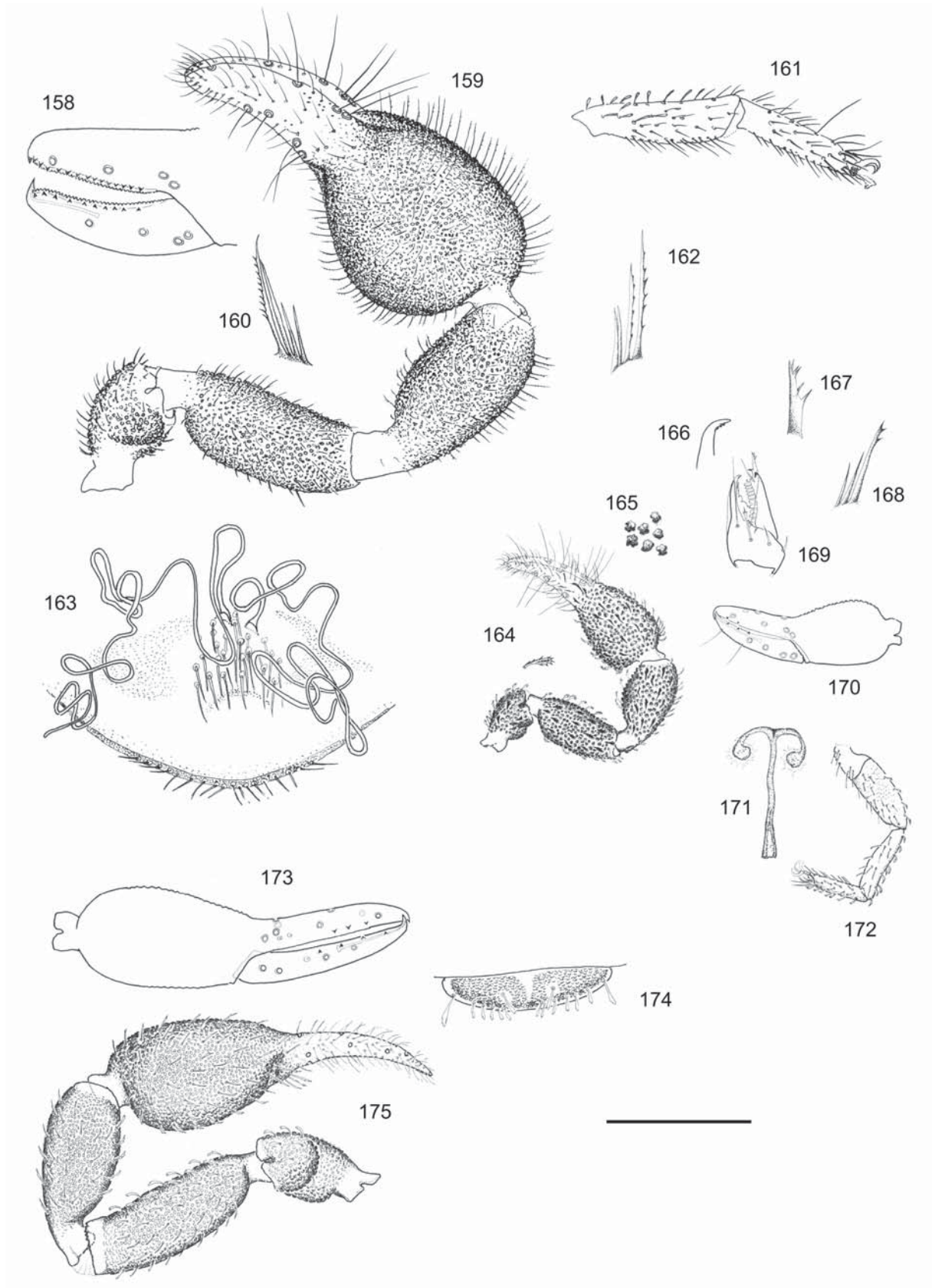
DESCRIPTION. Vestitural setae short, prominently denticuloclavate. Carapace slightly (1.024 times) longer than broad, of usual shape; two wide transverse furrows not deep but distinct. Chaetotaxy of carapace: four at anterior margin; ten at posterior margin; ca 85–90 setae in total. Tergal chaetotaxy: 15:16:16:19:20:19:17:15:15:10?:8?:2 (very short, but well-visible). Chaetotaxy of sternites: x:17:8:7:17:22:9?:8?:7?:5?:6:2.

Chelicera in basal part dorsally without weak net-like reticulation; five setae in basal part, only SB denticulate terminally; movable finger with a seta distad of midway of finger; serrula exterior with 13 lamellae; flagellum with three blades, anterior one distally weakly denticulate (3 small spinules). Galea with four subterminal and two terminal branches. Fixed finger with three small subapical teeth.

Palp of typical facies, with trichobothriotaxy as illustrated (Figs 164 & 170); relatively robust, small, with well-developed granulation (granules irregularly shaped, but precisely outlined). Proportions: trochanter 1.87 times as long as broad; femur 2.56 times as long as broad; patella 2.19 times as long as broad; chela with pedicel 2.812 times as long as broad; hand with pedicel 1.474 times as long as broad. Fixed finger of chela with 32 very small marginal teeth, as well as with three external and two internal accessory teeth; movable finger with 30 marginal teeth, three external and only one internal accessory tooth. Movable finger with two pseudotactile setae on ventral face. Nodus ramosus between ST and T. Apparently, sensory spots completely lacking.

Figs 136–157. *Allochernes loebli* sp.n. (136–147), holotype ♂ (136–138, 144–147), paratype ♀ (139–143), *Pselaphochernes scorpioides* (Hermann, 1804), ♀ from Bumburet (148–157): 136 — left palp, dorsal view; 137 — left chela, interolateral view, showing granulation; 138 — last tergite; 139 — last sternite; 140 — chelal fingers, exterolateral view; showing trichobothriotaxy and accessory teeth; 141 — flagellum; 142 — spermatheca; 143 — galea; 144 — left chelicera, dorsal view; 145 — galea; 146 — leg IV, lateral view; 147 — vestitural seta on tarsus IV; 148 — spermatheca; 149 — leg IV, lateral view; 150 — details of ventral femoral “margin”, showing chaetotaxy and microlyrifissures; 151 — flagellum; 152 — galea; 153 — right chelicera, dorsal view; 154 — last tergite; 155 — chelal fingers, interior view; 156 — chelal fingers, exterior view; 157 — right palp, dorsal view. Scale: 0.5 (136–140, 146, 149, 150, 154–157) and 0.25 mm (144, 153).

Рис. 136–157. *Allochernes loebli* sp.n. (136–147), голотип ♂ (136–138, 144–147), паратип ♀ (139–143), *Pselaphochernes scorpioides* (Германн, 1804), ♀ из Бумбурета (148–157): 136 — левая пальпа, вид сверху; 137 — левая хела, вид сбоку, изнутри, показана грануляция; 138 — последний тергит; 139 — последний стернит; 140 — пальцы левой хелы, вид сбоку, снаружи, показаны расположение трихоботрий и добавочные зубчики; 141 — флагеллум; 142 — сперматека; 143 — галея; 144 — левая хелицера, вид сверху; 145 — галея; 146 — нога IV, вид сбоку; 147 — покровная щетинка с лапки IV; 148 — сперматека; 149 — нога IV, вид сбоку; 150 — детали строения нижнего „края“ бедра ноги IV, показана хетотаксия и отверстие лировидного органа; 151 — флагеллум; 152 — галея; 153 — правая хелицера, вид сверху; 154 — последний тергит; 155 — пальцы хелы, вид изнутри; 156 — пальцы хелы, вид снаружи; 157 — правая пальпа, вид сверху. Масштаб: 0,5 (136–140, 146, 149, 150, 154–157) и 0,25 мм (144, 153).



Leg IV of typical chernetine facies (Fig. 172), without tactile setae, with numerous rather short denticulate setae; proportions: femur+patella 2.55 times as long as deep; tibia 4.21 times as long as deep; tarsus 4.21 times as long as deep.

Measurements (length/breadth, in mm). Carapace 0.43/0.42. Palp: trochanter 0.264/0.141; femur 0.39/0.153; patella 0.37/0.17; chela with pedicel 0.66/0.234; length of hand with pedicel 0.345; length of movable finger 0.33. Leg IV: femur+patella 0.38/0.15; tibia 0.29/0.07; tarsus 0.24/0.06.

DIAGNOSIS. Probably this is one of the smallest representatives of *Allochernes*. Besides the small size, it is distinguished by a slightly different shape of the spermatheca.

Allochernes wideri (C.L. Koch, 1843)

Figs 173–175.

MATERIAL. 1 ♀, 1 T — 33d, Hazara, above Naran [28], side valley, 2600 m, sifted dead leaves and branches rotting under *Castanea* tree, 1.VI.1983; 1 ♀ — 34a, between Naran and Kaghan (Kāgān) [29], 2300 m, under stones and in cowpats; 2.VI.1983, all leg. Cl. Besuchet & I. Löbl.

DESCRIPTION (♀ from Hazara — 33d). Carapace slightly longer than broad. Chaetotaxy: anterior margin with six setae, posterior margin with 14 setae (ca 80–85 setae in total). Chelicera: serrula externa with 17–18 lamellae; flagellum with three blades, anterior one denticulate distally.

Tergal chaetotaxy: 20:21:24:25:28:27:24:23:22:20:15:3(!). Last tergite with two long but denticuloclavate setae.

Chaetotaxy of sternites: x:14:24:10:19:28:20:20:19:18:11:2.

Palp with trichobothriotaxy as illustrated (Figs 173 & 175). Palp with well-developed granulation; proportions: femur 2.896 times as long as broad; patella 2.71 times as long as broad; chela with pedicel 3.24 times as long as broad. Fixed finger of chela laterally with three, movable finger laterally with four, accessory teeth; both fingers without accessory teeth on medial side.

Measurements (length/breadth, in mm). Palp: femur 0.73/0.252; patella 0.682/0.252; chela with pedicel 1.22/0.38; length of movable finger 0.61.

REMARKS. In all of its basic traits does the above sample agree completely with the numerous descriptions of *A. wideri* [e.g. Beier, 1932, 1963a]. Regrettably, the too limited material has not allowed me to make a preparation to examine such an important character as the shape of the spermatheca. Since Beier's [1978] record of this predominantly European species in Kashmir and Ladakh, the present, second report from Central Asia confirms the fairly vast distribution of *A. wideri*.

In general, a revision of the entire genus *Allochernes* is highly desirable. Several species have been described/diagnosed insufficiently well, their status remaining obscure.

Bipeltochernes gen.n.

Type species: *Bipeltochernes pakistanicus* sp.n.

DIAGNOSIS. Chernetidae of normal facies, though unusually large and brightly pigmented for species from Central Asia. Carapace, tergites and pedipalps reddish-brown, sternites and legs yellowish-brown. Carapace of usual shape, somewhat longer than posterior breadth; both anterior and posterior furrows deep and distinct; eye spots absent; teguments evenly and strongly granulate; vestitural setae long, prominently denticuloclavate. Tergal scuta strongly sclerotic and granulate, all tergal setae prominently denticuloclavate, so that expanded part with a clear rim like a swelling slightly transparent in the middle. Sternites well-defined, smooth anteriorly, but minutely denticulate on caudal segments. Anterior marginal setae simple and weakly denticulate, but some increasingly well denticuloclavate on caudal segments. Chela of palp with well-visible granulation sharply outlined and V-shaped on hand's ventral side; distal part of hand and base of fingers completely smooth and sparsely setose. Hand of chela evidently narrowed at base of fingers, with a medial projection. Distal parts of all legs likewise completely smooth. Spermatheca consisting of one thin tube branching into two strongly inflated terminally; three cribriform plates: one, central, large and both lateral ones elongate.

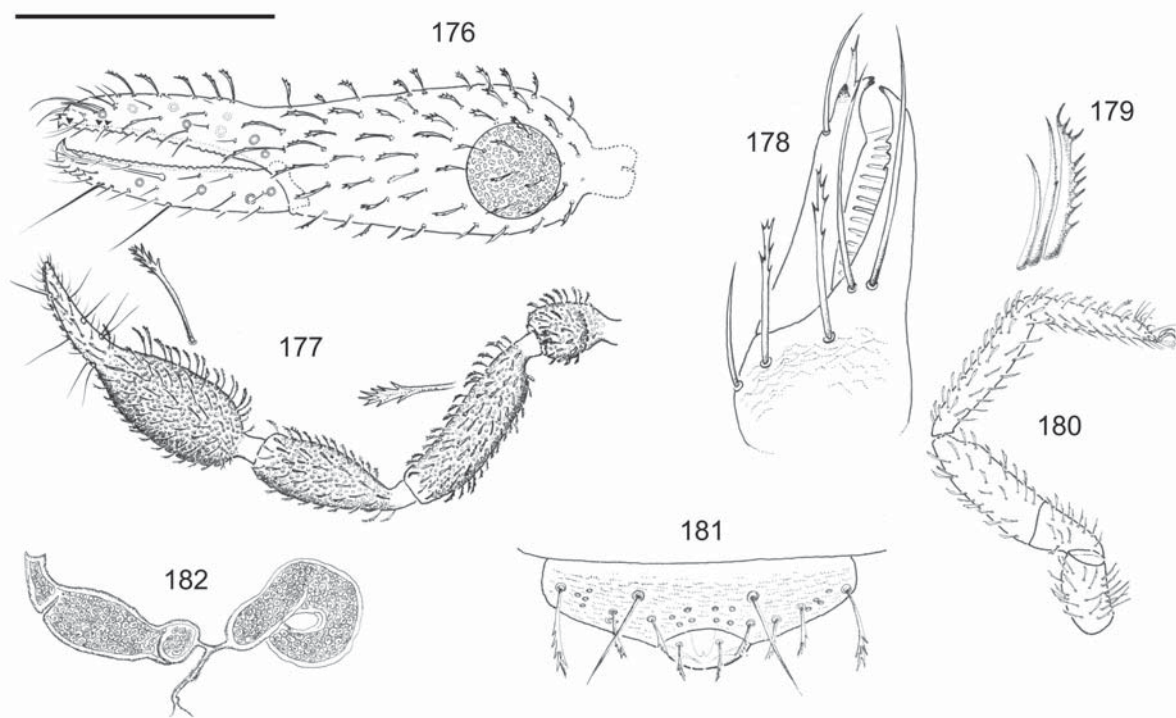
Chelicera with five setae on hand, seta SB being denticulate terminally; movable finger with one subterminal seta and an isolated apical tooth. Hand of chela evidently narrowed at base of fingers, but with neither an abrupt constriction nor sulcus. Dentition of chela of normal chernetid facies, marginal teeth as well as both lateral and medial accessory teeth present on each finger. Venom apparatus developed in movable finger only, nodus ramosus (nr) slightly proximal of trichobothrium T.

ETYMOLOGY. To emphasize the sharply interrupted granulation on the chela and legs looks like two "skins", from the Latin *pellis*.

RELATIONS. In the family Chernetidae, the new genus seems to occupy a highly isolated position. The peculiar granulation on the hand of the palp and on the legs, the disjunct shape of the spermatheca supplied with a large median cribriform plate, coupled with the rudimentary venom tooth and duct in the fixed finger of the chela seem to be apomorphic features unique among the chernetid genera.

Figs 158–175. *Dendrochernes cyrneus* (L. Koch, 1873) (158–163), ♀ from Miandam (158–161, 163), ♂ from Naran (162), *Allochernes minor* sp.n., holotype (164–172), *Allochernes wideri* (C.L.Koch, 1843), ♀ from Hazara (173–175): 158 — left chelal fingers, exterolateral view; 159 — right palp, dorsal view; 160 — flagellum; 161 — tarsus and tibia IV, lateral view; 162 — flagellum; 163 — operculum with spermatheca, dorsal view; 164 — right palp, dorsal view, insertion showing vestitural setae; 165 — chelal granulation; 166 — tip of cheliceral fixed finger, dorsal view; 167 — galea; 168 — flagellum; 169 — right chelicera, dorsal view; 170 — left chela, exterolateral view, showing trichobothriotaxy and pseudotactile setae; 171 — spermatheca; 172 — leg IV, lateral view; 173 — right chela, exterolateral view; 174 — last tergite; 175, left palp, dorsal view. Scale: 0.5 (158, 159, 161, 164, 170, 172–175) and 0.25 mm (163, 169).

Рис. 158–175. *Dendrochernes cyrneus* (L. Koch, 1873) (158–163), ♀ из Миандама (158–161, 163), ♂ из Нарана (162), *Allochernes minor* sp.n., голотип (164–172), *Allochernes wideri* (C.L.Koch, 1843), ♀ из Хазары (173–175): 158 — пальцы левой хели, вид сбоку, изнутри; 159 — правая пальпа, вид сверху; 160 — флагеллум; 161 — голень и лапка IV, вид сбоку; 162 — флагеллум; 163 — оперкулум с сперматекой, вид сверху; 164 — правая пальпа, вид сверху, внутри показана покровная щетинка; 165 — грануляция хели; 166 — вершина неподвижного пальца хелицеры, вид сверху; 167 — галеа; 168 — флагеллум; 169 — правая хелицера, вид сверху; 170 — левая хела, вид сбоку снаружи, показаны трихоботротаксия и псевдотактильные волоски; 171 — сперматекка; 172 — нога IV, вид сбоку; 173 — правая хела, вид сбоку снаружи; 174 — последний тергит; 175, левая пальпа, вид сверху. Масштаб: 0,5 (158, 159, 161, 164, 170, 172–175) и 0,25 мм (163, 169).



Figs 176–182. *Ceriochernes* (?) *vestitus* (Beier, 1974), ♂ from Dunga Gali (176–178), ♂ from Changla Gali (179–181), ♀ from Pass Ustui (182): 176 — left chela, extero-lateral view; 177 — left palp, dorsal view, insertion showing vestiture setae; 178 — left chelicera, dorsal view; 179 — flagellum; 180 — leg IV, lateral view; 181 — last sternite; 182 — spermatheca. Scale: 0.95 (177), 0.5 (176), 0.38 (180), 0.33 (181, 182) and 0.12 mm (178).

Рис. 176–182. *Ceriochernes* (?) *vestitus* (Beier, 1974), ♂ из Дунга Гали (176–178), ♂ из Чангла Гали (179–181), ♀ с перевала Устуй (182): 176 — левая хела, вид сбоку снаружи; 177 — левая пальпа, вид сверху, внутри показаны покровные щетинки; 178 — левая хелицера, вид сверху; 179 — флагеллум; 180 — нога IV, вид сбоку; 181 — последний стернит; 182 — сперматека. Масштаб: 0,95 (177), 0,5 (176), 0,38 (180), 0,33 (181, 182) и 0,12 мм (178).

Bipeltochernes pakistanicus sp.n.

Figs 191–205.

MATERIAL. Holotype ♂ — PAK-84/29, Punjab, Murree [1], 1950 m, hole in *Prunus* tree with *Lasius* sp. nest, 25.IV.1984, leg. S. Vit. Paratypes: 2 ♂♂, 2 ♀♀, 1 T, 8 DD, same data as holotype.

DESCRIPTION. MALE (Holotype; Figs 192–198, 200, 203–205). Carapace slightly (1.172 times) longer than broad. Chaetotaxy: anterior margin with six setae, posterior margin with 12 setae (ca 70–75 setae in total). Tergal chaetotaxy: 15:15:15:19:22:21:24:19:20:24:13:2 (short, but incrassate and denticulate terminally). Manducatory process with one apical seta and two subapical, rather long setae. Chaetotaxy of sternites: x:42:15:11:22:26:27:24:24:20:11:2; each sternite with 10–20 small pores.

Chelicera in basal part with moderate mesh-like reticulation dorsally; five setae in basal part, only seta SB denticulate terminally; movable finger with a seta distad of midway of finger; serrula exterior with 19 lamellae; flagellum with three blades, anterior one denticulate distally (10–11 spinules). Galea with four short subterminal and terminal branches. Fixed finger with three small subapical and six intermediate teeth.

Palp with trichobothriotaxy as illustrated (Figs 194–197). Palp relatively robust, fingers rather thick in dorsal view, especially so closer to base; proportions: trochanter 1.735

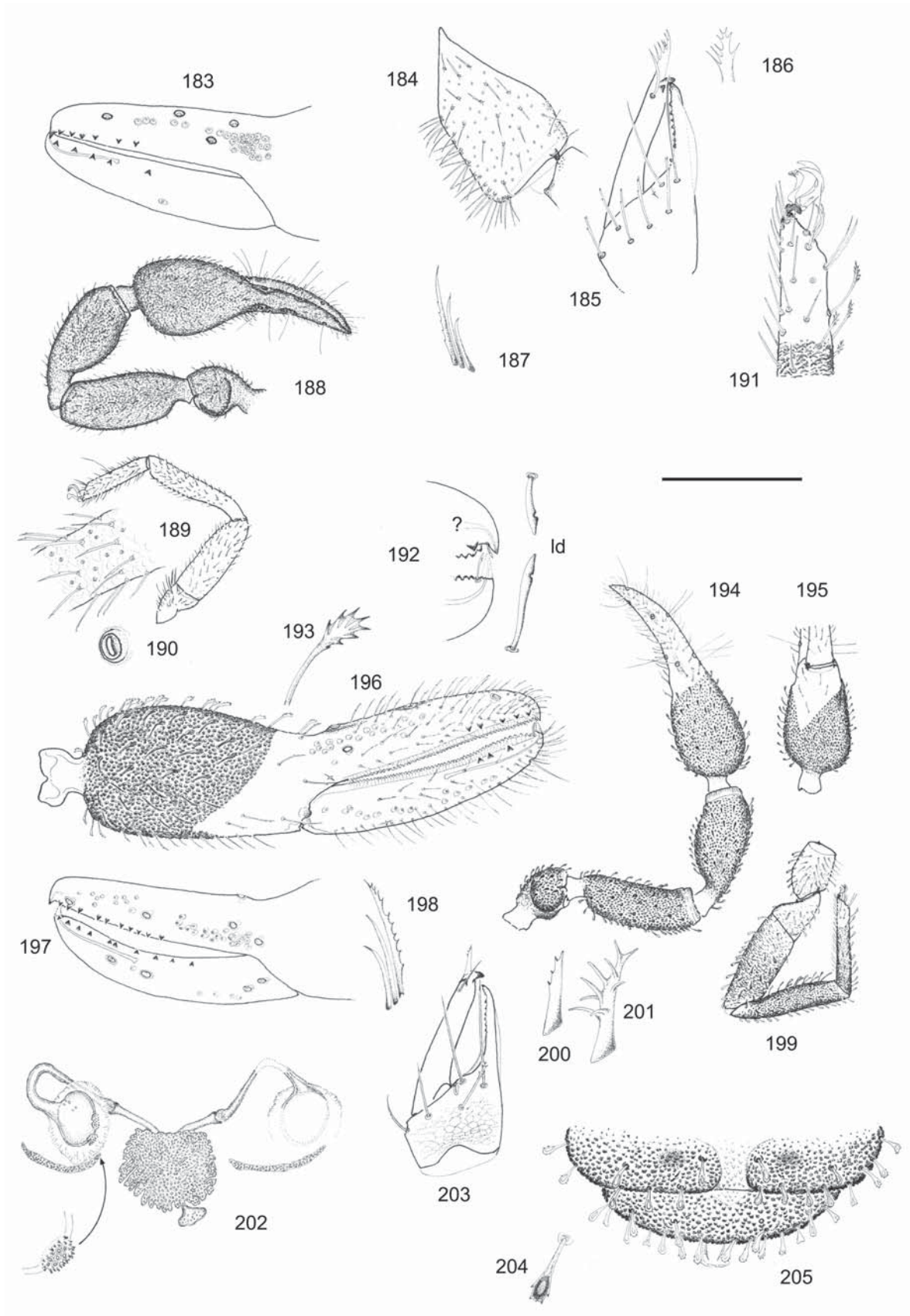
times as long as broad; femur 3.36 times as long as broad; patella 2.64 times as long as broad; chela with pedicel 3.71 times as long as broad, its chaetotaxy pattern, venom apparatus and dentition as illustrated (Figs 196 & 197). Fixed finger of chela with 51 marginal teeth, as well as ten accessory teeth on lateral side and five on medial side; movable finger with 52 marginal teeth, as well as ten accessory teeth on lateral side and three on medial side. Both fingers with numerous pores (sensory spots). Lamina defensor with a subapical notch present on one side of both fingers.

Venom duct in movable finger elongate, nodus ramosus close to ST.

Leg IV of typical chernetine facies (Figs 191, 199), tibia and tarsus without tactile setae, but with numerous, long, denticulate setae and well-developed granulation; tarsus polished in terminal portion only; proportions: femur+patella 3.933 times as long as deep; tibia 4.953 times as long as deep; tarsus 6.157 times as long as deep.

Measurements (length/breadth, in mm). Carapace 1.09/0.93. Palp: trochanter 0.59/0.34; femur 1.082/0.322; patella 0.976/0.37; chela with pedicel 1.78/0.48; length of movable finger 0.99. Leg IV: femur+patella 1.07/0.272; tibia 0.852/0.172; tarsus 0.702/0.114.

FEMALE (Paratype; Figs 191, 199, 201, 202). Larger, in main characters similar to male. Galea strongly different from ♂, with nine very long subterminal and terminal branches. Tergal chaetotaxy: 16:16:17:23:21:23:22:22:22:20:18:2.



Spermatheca as illustrated (Fig. 202), with one large central and two lateral elongate cribriform plates. Palp proportions: trochanter 1.7 times as long as broad; femur 2.51 times as long as broad; patella 2.73 times as long as broad; chela with pedicel 3.551 times as long as broad.

Measurements (length/breadth, in mm). Palp: trochanter 0.56/0.33; femur 1.08/0.43; patella 1.01/0.37; chela with pedicel 1.79/0.504.

DEUTONYMPH. Except for the considerably smaller size, deutonymph very much like adults.

Palp proportions: femur 2.79 times as long as broad; patella 2.18 times as long as broad; chela with pedicel 3.020 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 0.502/0.18; patella 0.47/0.216; chela with pedicel 0.88/0.29.

PROTONYMPH. Palp proportions: femur 2.714 times as long as broad; patella 2.062 times as long as broad; chela with pedicel 2.863 times as long as broad.

Measurements (length/breadth, in mm). Palp: femur 0.38/0.14; patella 0.33/0.16; chela with pedicel 0.63/0.22.

Ceriochernes (?) *vestitus* (Beier, 1974)

Figs 176–182.

MATERIAL. 1 ♂, 2 TT — 23, Chitral, Lawarai Pass [31], 2600 m, sifting in *Picea* and *Abies* forest with *Cedrus*, rotten wood and dead leaves, 23.V.1983; 1 D — 28b, Chitral, N of Madaglasht [34], side valley, 3050 m, litter, 27.V.1983; 1 ♂, 1 ♀ — 25e, Chitral, above Bumburet, in valley leading to Ustui Pass [30], sifted dead leaves under *Viburnum* shrubs, 2700 m, 25.V.1983; 1 ♀ — 28d, Chitral, N of Madaglasht [34], side valley, 2950 m, litter, 27.V.1983; 1 ♀ — 6c, Swat, above Miandam [7], 2300 m, sifting near foot of *Abies* stump, 10.V.1983; 1 ♀, 1 T — 12c, Swat, above Utrot [19], *Abies* forest with *Cedrus*, 2500–2600 m, sifted rotten *Abies* wood, 14.VI.1983; 1 ♀ — 34a, between Naran and Kaghan (Kāgān) [29], 2300 m, under stones and in cowpats, 2.VI.1983, all leg. Cl. Besuchet & I. Löbl; 1 ♂ — PAK-84/2, Hazara, Dunga Gali [27], 2300 m, rotten stump of broad-leaved tree, 17.IV.1984; 1 ♂ — PAK-84/6, Hazara, Changla Gali [35], 2500 m, rotten trunk of *Fraxinus*, 17. IV.1984, all leg. S. Vit.

DESCRIPTION. Vestitural setae long, prominently denticuloclavate, very densely located on carapace and palp,

especially long setae at internal margin of hand, closer to base of fingers. Almost all specimens with very strongly greased covers. Carapace slightly longer than broad, of usual shape, somewhat longer than posterior breadth; two transverse furrows deep and distinct. Tergal chaetotaxy: ♂♂ — 15–16:19–20:17–19:20–21:20–22:19–22:19–20:22:19:16–19:12:2; ♀ — 17:18:17:20:20:21:21:21:20:20:9:2. Manducatory process with one short apical seta and two subapical, rather long setae. Chaetotaxy of sternites: ♂ — x:ca 25:ca 16:25:22:24:24:22:19:10 (8+2 rather long tactile medial setae):2.

Sternites VII–X with long and denticulate setae at lateral edges. Spermatheca of facies completely atypical for *Ceriochernes* Beier, 1937, as compared to Mahner's fig. 51 [1985: p. 241], consisting of two oblong sacks (Fig. 182).

Chelicera in basal part with five setae, B and SB incrasate and dentate terminally (Fig. 178); movable finger with one seta; serrula exterior with 16 lamellae; flagellum with three blades, first one strongly denticulate anteriorly (Fig. 179). Fixed finger with three intermediate teeth.

Palp of typical chernetine facies, with trichobothriotaxy as illustrated (Figs 176 & 177). Palp relatively slender, with strong granulation. Proportions: femur 3.46–3.76 (♂) or 3.403 (♀) times as long as broad; patella 2.97–3.0 (♂) or 2.71 (♀) times as long as broad; chela with pedicel 3.68–3.74 (♂) or 3.54 (♀) times as long as broad. Fixed finger with 37, movable fingers of chela with ca 27, marginal teeth. Three internal accessory teeth present only on fixed finger, rather closely parallel to marginal series, only moderately larger than marginal teeth.

Node ramosus close to trichobothrium T. Movable finger with two accessory pseudotactile setae.

Leg IV (Fig. 180) without tactile setae on tibia and tarsus.

Measurements (length/breadth, in mm). Palp: femur 0.64–0.76/0.184–0.202 (♂♂), 0.66/0.194 (♀); patella 0.62–0.69/0.21–0.23 (♂♂), 0.59/0.22 (♀); chela with pedicel 1.04–1.13/0.282–0.302 (♂♂), 1.034/0.292 (♀); hand with pedicel 0.55 (♂); movable finger 0.51 (♂).

REMARKS. The above description and illustrations still fail to provide an answer, which species and even genus we face. It seems quite problematic that the genus *Ceriochernes* Beier, 1937 shows such a vast distribution as to range from

Figs 183–205, 183–190. *Megachernes pavlovskiyi* Redikorzev, 1949, ♀ from Marghuzar (183–190), *Bipeltocernes pakistanicus* gen.n., sp.n. (191–205), ♂ holotype (192–198, 200, 203–205), ♀ paratype (191, 199, 201, 202): 183 — right chelal fingers, interolateral view, showing sensory spots; 184 — left coxa IV, lateral view; 185 — left chelicera, dorsal view; 186 — galea, exterolateral view; 187 — flagellum; 188 — left palp, dorsal view; 189 — leg IV, lateral view, insertion showing details of tarsus; 190 — sensory(?) pore of tarsus IV; 191 — tip of tarsus IV, lateral view; 192 — tip of chelal fingers, lateral view, nearby showing the venom apparatus (*lamina defensor*, ld); 193 — denticuloclavate seta in anterior portion of chelal hand; 194 — right palp, dorsal view; 195 — chelal hand, ventral view, note the pattern of granulation; 196 — interior view of left chela, note the pattern of granulation; 197 — exterior view of left chelal fingers; 198 — flagellum; 199 — leg IV, lateral view; 200, 201 — galea; 202 — spermatheca, ventral view, details showing the microcribriform plate of an expanded sac; 203 — left chelicera, dorsal view; 204 — denticuloclavate seta at posterior margin of tergites; 205 — last tergites. Scale: 1.0 (188, 189, 194, 195, 199), 0.5 (183, 184, 196, 197, 205) and 0.25 mm (185, 191, 192, 203).

Рис. 183–205. *Megachernes pavlovskiyi* Redikorzev, 1949, ♀ из Маргузара (183–190), *Bipeltocernes pakistanicus* gen.n., sp.n. (191–205), ♂ голотип (192–198, 200, 203–205), ♀ паратип (191, 199, 201, 202): 183 — пальцы правой хелы, вид сбоку изнутри, показаны сенсорные пятна; 184 — тазик левой ноги IV, вид снизу; 185 — левая хелицера, вид сверху; 186 — галея, вид сбоку снаружи; 187 — флагеллум; 188 — левая лапка, вид сверху; 189 — нога IV, вид сбоку, внутри показана деталь строения лапки; 190 — чувствительная (?) пора лапки IV; 191 — терминальный конец лапки IV, вид сбоку; 192 — вершина пальцев хелы, вид сбоку, рядом показаны элементы ядовитого аппарата (*lamina defensor*, ld); 193 — зубчатая и расширенная щетинка с передней части руки хелы; 194 — правая лапка, вид сверху; 195 — рука хелы, вид снизу, обратить внимание на характер грануляции; 196 — левая хела, вид сбоку изнутри, обратить внимание на характер грануляции; 197 — пальцы левой хелы, вид сбоку снаружи; 198 — флагеллум; 199 — нога IV, вид сбоку; 200 и 201 — галея; 202 — сперматека, вид снизу, показана деталь строения микроситовидной пластинки на расширенном придатке; 203 — левая хелицера, вид сверху; 204 — зубчатая и расширенная щетинка с заднего края тергитов; 205 — последние тергиты. Масштаб: 1,0 (188, 189, 194, 195, 199), 0,5 (183, 184, 196, 197, 205) и 0,25 мм (185, 191, 192, 203).

South America to the Himalayas and the Philippines. The known description of *C. vestitus* from Nepal [Beier, 1974] fits the above samples best. Furthermore, it would seem quite logical that the distribution of this species covers the high-montane areas of northern Pakistan as well. However, the detailed description of *Ceriochernes* (?) *amazonicus* Mahnert, 1985 from Brazil!), especially the spermatheca, does not allow me to identify these samples more accurately. In a number of characters, these examples are close to *Allochernes*, but in other traits, such as the structure of the spermatheca and the palpal chaetotaxy, they do not fit in. This situation strongly resembles that concerning *Allochernes* (?) *bactrinus* Dashdamirov & Schawaller, 1995 and *A. turanicus* (Redikorzev, 1934), both these species from Middle Asia. Most probably, erection of new genera will prove necessary to properly allocate all such problematic species. First of all, this will require a restudy of type material of *Ceriochernes* (?) *vestitus*, *C. detritus* Beier, 1937 (the type species of the genus, described from the Philippines) and some other nominal congeners from Nepal and South America.

Chernetidae gen.sp.

MATERIAL. 1 D — PAK-84/7, Hazara, Changla Gali [35], 2500 m, in litter, 17.IV.1984; 1 T (only palpal chela), 2 PP — PAK-85/17, Hazara, Kaghan (Kāgān) Valley, NE-Mahandri (Mahāndri) [26], Kamalban forest, 2200 m, stump of *Aesculus*, 3.VII.1985, all leg. S. Vit; 1 T — 33c, Hazara, above Naran [28], in the lateral valley, 2600 m, sifted rotten wood; 1.VI.1983; 1 P — 4b, Swat, Malam Jabba [12], sifted herbs, moss, *Polyporus* and rotten wood, 2400 m, 9.V.1983, all leg. Cl. Besuchet & I. Löbl.

REMARK. The above material being represented by nymphs alone, a closer identification is impossible to make.

Dendrochernes cyrneus (L. Koch, 1873)

Figs 158–163.

MATERIAL. 5 ♂♂, 1 ♀, 4 TT, 1 P — 6c, Swat, above Miandam [7], 2300 m, sifting near foot of *Abies* stump, 10.V.1983; 2 ♂♂, 5 ♀♀, 2 TT — 11e, Swat, above Utrot [19], *Abies* forest with *Cedrus*, sifted rotten wood, dead leaves and moss, 2500 m, 13.V.1983; 1 ♂, 2 ♀♀, 7 TT, 1 P — 12a, Swat, above Utrot [19], *Abies* forest with *Cedrus*, 2500–2600 m, 14.VI.1983; 1 ♂, 2 TT, 2 PP — 12c, Swat, above Utrot [19], *Abies* forest with *Cedrus*, 2500–2600 m, sifted rotten *Abies* wood, 14.VI.1983; 1 T — 11 D, Swat, above Utrot [19], *Abies* forest with *Cedrus*, sifted moss, with a little of rotten wood, 2600 m, 13.V.1983; 2 ♂♂, 3 TT, 1 D — 11c, Swat, above Utrot [19], *Abies* forest with *Cedrus*, sifted rotten wood, 2800 m, 13.V.1983; 1 ♂ — 12b, Swat, above Utrot [19], *Abies* forest with *Cedrus*, 2500–2600 m, under *Abies* bark, 14.VI.1983; 1 ♂ — 4c, Swat, Malam Jabba [12], sifting in *Pinus* forest, at foot of *Pinus* and *Juglans* trees, 2300 m, 9.V.1983; 1 ♀ — 15b, Swat, above Miandam [7], 2400–2500 m, *Abies* forest, sifted dead leaves and moss, 17.V. 1983; 1 ♀, 2 TT — 33c, Hazara, above Naran [28], in the lateral valley, 2600 m, sifted rotten wood; 1.VI.1983; 1 ♀, 2 TT — 33d, Hazara, above Naran [28], side valley, 2600 m, sifted dead leaves and branches rotting under *Castanea* trees, 1.VI.1983; 3 ♀♀ — 34a, between Naran and Kaghan (Kāgān) [29], 2300 m, under stones and in cowpats, 2.VI.1983; 1 ♂ — 40, Punjab, Murree [1], 2100 m, sifted dead leaves in broad-leaved forest with *Pinus*, 5.VI.1983, all leg. Cl. Besuchet & I. Löbl.

REMARK. This species is rather easy to identify by the stouter chela, the distally located tactile seta on tarsus IV, and trichothrium ST of the palpal movable finger situated closer to SB than to T. Besides this, the chelal fingers show more than ten accessory teeth and the flagellum consists of four blades.

This species is rather widespread in Europe, the Mediterranean and Central Asia, although it occurs not so often compared to other arboricoles.

Dinocheirus aff. *transcaspius* (Redikorzev, 1922) Figs 206–214.

MATERIAL. 1 ♀ — 34a, between Naran and Kaghan (Kāgān) [29], 2300 m, under stones and in cowpats, 2.VI.1983, leg. Cl. Besuchet & I. Löbl.

DESCRIPTION. Vestitural setae long, prominently denticuloclavate. Carapace slightly (1.27 times) longer than broad, of usual shape, somewhat longer than posterior breadth; two transverse furrows deep and distinct. Chaetotaxy: anterior margin with six setae, posterior margin with 12 setae (ca 80 setae in total). Tergal chaetotaxy: 16:18:19:20:20:18:18:17:17:16:13(11+2 tactile setae):2. Manducatory process with one apical seta and two subapical, rather long setae. Chaetotaxy of sternites: x:19:10:9:20:22:21:21:20:18:9(5+4 long tactile setae):2.

Sternites VII–X with long and denticulate setae at lateral edges.

Spermatheca of facies typical for the genus, consisting of two long tubes.

Chelicera in basal part with five acuminate setae; movable finger with one seta; serrula exterior with 18 lamellae; flagellum with three blades denticulate anteriorly (Fig. 208). Galea with six subterminal and terminal branches. Fixed finger with four intermediate teeth.

Palp with trichobothriotaxy as illustrated (Figs 206, 207). Palp relatively robust; proximal part of femur strongly elevated in ventrodorsal direction; femur with well-developed granulation, but on dorsal side two large spots without granulation as illustrated (Fig. 207). Patella with granulation only on medial and lateral sides. Base of fingers, as well as lateral and medial sides with fine granulation. Proportions: femur 2.73 times as long as broad; patella 2.34 times as long as broad; chela with pedicel 3.085 times as long as broad. Both fixed and movable fingers of chela with 44 marginal teeth, as well as with eight accessory teeth on lateral side and three on medial side; nodus ramosus closer to ST than to T.

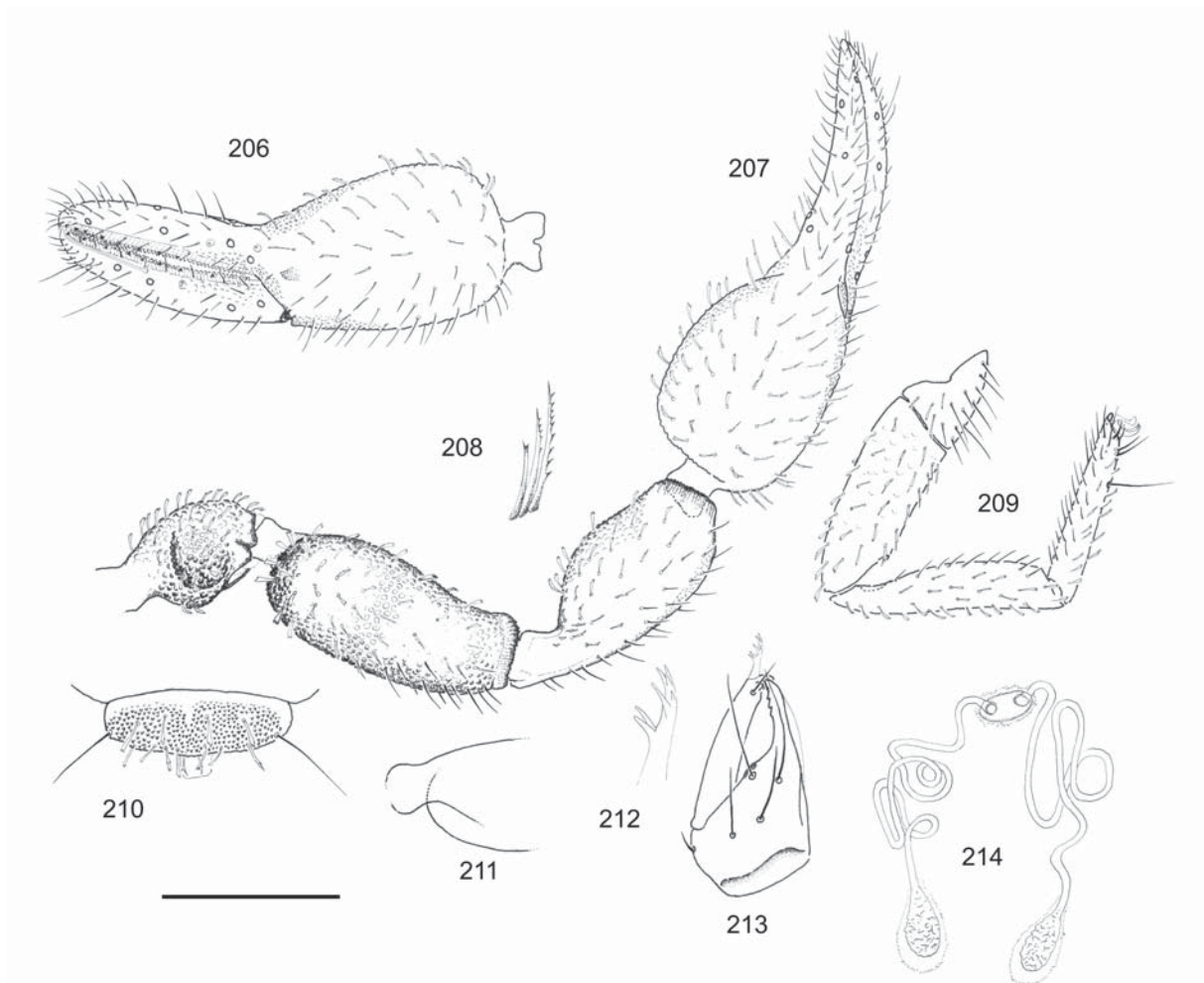
Leg IV (Fig. 209) with rather long tactile setae on tarsus (TS=0.66); proportions: femur+patella 3.77 times as long as deep; tibia 4.924 times as long as deep; tarsus 6.252 times as long as deep.

Measurements (length/breadth, in mm). Carapace 0.99/0.782. Palp: femur 0.818/0.3; patella 0.744/0.32; chela with pedicel 1.38/0.45; length of movable finger 0.99. Leg IV: femur+patella 0.81/0.215; tibia 0.65/0.132; tarsus 0.544/0.087.

REMARKS. The attribution of the above female to *Dinocheirus transcaspicus* is questionable because of the granulation pattern of the palpal femur. In addition, the shape of the femur, especially its base, is rather peculiar, also differing from Middle Asian samples [Dashdamirov & Schawaller, 1995].

Megachernes pavlovskyi Redikorzev, 1949 Figs 183–190.

MATERIAL. 1 ♀ — PAK 84/21, Punjab, Murree [1], roots of *Aesculus* and nest of rodent, 1950 m, 23.IV.1984, leg. S. Vit; 1 ♀ — 2a, Swat, Marghuzar [13], S of Saidu Sharif, under stones at the edge of a stream, 1300 m, 8.V.1983, leg. Cl. Besuchet & I. Löbl.



Figs 206–214. *Dinocheirus* aff. *transcaspicus* (Redikorzev, 1922), ♀: 206 — left chela, exterolateral view; 207 — right palp, dorsal view; 208 — flagellum; 209 — leg IV, lateral view; 210 — last tergite; 211 — left palpal femur, ventral view of proximal portion; 212 — galea; 213 — left chelicera, dorsal view; 214 — spermatheca. Scale: 0.5 (206, 207, 209–211) and 0.25 mm (213, 214).

Рис. 206–214. *Dinocheirus* aff. *transcaspicus* (Redikorzev, 1922), ♀: 206 — левая хела, вид сбоку снаружи; 207 — правая палепа, вид сверху; 208 — флагеллум; 209 — нога IV, вид сбоку; 210 — последний тергит; 211 — левое бедро палепы, проксимальная часть, вид снизу; 212 — галеа; 213 — левая хелицера, вид сверху; 214 — сперматека. Масштаб: 0,5 (206, 207, 209–211) и 0,25 мм (213, 214).

DESCRIPTION. FEMALE (from Swat, Marghuzar — 2a). A very large, brightly coloured species. Carapace slightly longer than broad. Chelicera with seven setae in basal part; movable finger with a seta distad of midway of finger; serrula exterior with 23 lamellae; flagellum with three blades, anterior one denticulate (5 spinules) distally. Galea with eight subterminal and terminal branches. Fixed finger with two small subapical and nine intermediate teeth.

Palp with trichobothriotaxy as illustrated (Figs 183 & 188). Palp relatively robust, with moderate granulation covering fingers down to the end; proportions: femur 2.51 times as long as broad; patella 2.381 times as long as broad; chela with pedicel 3.094 times as long as broad. Fixed finger of chela with 50 marginal teeth, as well as ten accessory teeth on lateral side and six on medial side; movable finger with 55 marginal teeth, nine accessory teeth on lateral side and five on medial side. Fixed finger with numerous pores (sensory spots) medially.

Leg IV (Figs 189 & 190) with one tactile seta on tarsus in dorsal aspect, and with numerous pores (sensory?), especially in distal parts.

Measurements (length/breadth, in mm). Palp: femur 1.012/0.404; patella 1.00/0.42; chela with pedicel 1.72/0.56.

REMARKS. This material only slightly differs from the original description as given by Redikorzev [1949]. The above brief redescription is of importance in view of another species, *M. afghanicus* Beier, 1959, described from Afghanistan [Beier, 1959a], being very close to, if not identical with, *M. pavlovskiyi*. A final solution will require a detailed restudy of *M. afghanicus* material.

M. pavlovskiyi is a rather widespread species hitherto revealed in the Caucasus [Schawaller & Dashdamirov, 1988] and Central Asia [Schawaller, 1986; Dashdamirov & Schawaller, 1995]. This species occurs in human settlements, caves and grottoes, being associated with bats and living on guano, as a rule. Its vast distribution is presumably due to phoresy on bats.

Pselaphochernes scorpioides (Hermann, 1804)
Figs 148–157.

MATERIAL. 1 ♀, 1 T — 24b, Chitral, Bumburet [2], sifted dead leaves and rotten wood, 2200 m; 24.V.1983, leg. Cl. Besuchet & I. Löbl.

DESCRIPTION. FEMALE. Vestitural setae rather short, only weakly denticuloclavate, rather long setae at internal margin of hand, closer to base of fingers. Carapace slightly longer than broad, of usual shape, somewhat longer than posterior breadth; two transverse furrows deep and distinct. Chaetotaxy: anterior margin with six, posterior margin with ten, setae; ca 65–70 setae in total. Tergal chaetotaxy: 16:18:20:21:20:20:21:22:21:18:12(10+2 tactile (?) setae):2. Manducatory process with one short apical seta and two subapical, rather long setae. Chaetotaxy of sternites: x:25:8:6:15:19:21:20:18:17:9(5+4 rather long tactile setae):2. Sternites VII–X with long and denticulate setae at lateral edges. Spermatheca as in Fig. 148.

Chelicera in basal part with five setae, B and SB rather short, incrassate and dentate terminally (Fig. 153), all others acuminate; movable finger with one long seta; serrula exterior with 18 lamellae; flagellum with three blades, first one denticulate anteriorly as in Fig. 151, second blade with only a small spinule on anterior side. Fixed finger with three intermediate teeth.

Palp of typical chernetine facies, with trichobothriotaxy as illustrated (Figs 155–157). Palp relatively slender, with strong granulation. Proportions: femur 3.17 times as long as broad; patella 2.492 times as long as broad; chela with pedicel 3.17 times as long as broad; hand with pedicel 1.84 times as long as broad. Fixed finger with 39, movable fingers of chela with 44, marginal teeth. Exterior and interior accessory teeth very closely parallel to marginal series, only moderately larger than marginal teeth. Fixed finger with five exterior and one interior accessory tooth; movable finger with two exterior accessory teeth only. Nodus ramosus between T and ST. Movable finger with two accessory pseudotactile setae.

Leg IV (Figs 149 & 150) with moderate scaly granulation on tibia and patella, with one tactile seta on tarsus (TS=0.55). Proportions: femur+patella 3.62 times as long as deep; tibia 4.796 times as long as deep; tarsus 5.83 times as long as deep.

Measurements (length/breadth, in mm). Palp: femur 0.69/0.22; patella 0.62/0.25; chela with pedicel 1.204/0.38; hand with pedicel 0.7; movable finger 0.61. Leg IV: femur+patella 0.662/0.183; tibia 0.52/0.11; tarsus 0.402/0.07.

REMARKS. Unfortunately, the above material is too scant to provide an answer to some questions. First of all, the presence of this Mediterranean species as far as Pakistan in the East seems quite disputable. In particular, if one compares the size and proportions of the material from Pakistan with those of the “classical” *P. scorpioides* as quoted by Beier [1963] and the description of *P. macrochaetus* Redikorzev, 1949, which Schawaller [1989] synonymized with *P. scorpioides*, the Asian specimens appear to be larger and also show slenderer(!) palps. For example, in *P. scorpioides* from Europe, the femur is 0.43–0.46/0.17–0.19, and 2.5–2.6 times as long as broad; the patella is 0.43–0.46/0.19–0.22, and 2.2 times as long as broad; the chela is 2.7–2.9 times as long as broad; the hand is 0.43–0.48/0.29–0.31, and 1.5 times as long as broad. In Asian specimens, the femur is 0.69/0.22, and 3.17 times as long as broad; the patella is 0.62/0.25, and 2.49 times as long as broad; the chela is 3.17 times as long as broad; the hand is 0.7/0.38, and 1.84 times as long as broad. In addition, the maximum number of setae in European *P. scorpioides* reaches seven per half-tergite,

whereas in Asian examples there are 8–11 setae. Furthermore, even a superficial comparison of the above material from Pakistan with samples, e.g., from the Caucasus reveals considerable differences existing between them.

Summarising all this evidence, the synonymy proposed by Schawaller [1989] might well prove to be wrong. To clarify the problem, a restudy of type material of *P. macrochaetus* is necessary.

Concluding remarks

Like in the other arid parts of mountainous Asia, the Pakistan faunas of the mainly hygrophilous families Chthoniidae and Tridenchthoniidae appear to be somewhat impoverished. The former family is represented by three uncommon species, i.e. *Lagynochthonius himalayensis*, *Tyrannochthonius oligochetus* and *Mundochthonius asiaticus*, while the latter family by two species only: *Rheoditella kalashana* and *R. swetlanae*.

Quite surprising appears to be the presence in Pakistan of a species of *Mundochthonius*, a genus hitherto known only in America (western and central U.S.A., Mexico, Dominican Republic), Europe (Austria, Poland) and the Far East (Russia, South Korea, Japan).

Members of the family Neobisiidae are rather well represented in the fauna of northern Pakistan: *Bisetocreagris afghanica*, *B. klapperichi*, *Microbisium brevifemuratum* and three species of *Stenohya*.

Olpiidae are represented by two species: *Calocheiridius centralis* and *Olpium (?) lindbergi*. Similarly, northern Pakistan supports two corticolous species of the family Cheiridiidae: *Cheiridium minor* and *C. museorum*.

Atemnus politus is yet the only species representing the family Atemnidae in Pakistan.

As expected, the deserticolous to semi-deserticolous family Chernetidae appears dominating, with ten species involved: *Allochernes loebli*, *A. tucanus*, *A. minor*, the Mediterranean *A. wideri*, *Bipeltochernes pakistanicus*, *Ceriochernes (?) vestitus*, *Dendrochernes cyrneus*, *Dinocheirus* aff. *transcaspius*, *Megachernes pavlovskiyi* and *Pselaphochernes scorpioides*.

Although there are no Withiidae in the material studied here, *Nannowithius pakistanicus* has been described from the Kashmir part of Pakistan.

Geogarypidae seem to be represented by two species, *Geogarypus* aff. *continentalis* and yet one more, probably new congener.

The family Cheliferidae is rather poorly represented even compared to the faunas of the adjacent parts of Afghanistan, Tajikistan, Kirghizia, Uzbekistan, Turkmenistan and Kazakhstan. At present, only four species are known from northern Pakistan: *Dactylochelififer brachialis*, *D. intermedius*, *D. monticola* and “*Chelififer*” *baltistanus*.

In general, the false-scorpion fauna of the northern mountainous provinces of Pakistan can be concluded to be Palaearctic, with only few species derived from the Oriental Region, i.e. *Lagynochthonius himalayensis*, *Tyrannochthonius oligochetus* and several species(?) of *Stenohya*.

It must be noted, however, that such a conclusion is only preliminary and only concerns the northern, mon-

tane areas of Pakistan. Information on the other parts of Pakistan is too fragmentary and incomplete to warrant any further speculations.

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